COMSPHERE 3800*PLUS* MODEMS

USER'S GUIDE

Document No. 3980-A2-GB30-41

February 2002

PARADYNE™

COMSPHERE
3800*Plus* Modems
User's Guide

3980-A2-GB30-41

6th Edition (February 2002)

Changes and enhancements to the product and to the information herein will be documented and issued as a new release to this manual.

For the 3810*Plus* standalone modems the Universal Service Order Code (USOC) for Permissive mode is RJ11C. The Canadian equivalent to the USOC is CA11. For the 3811*Plus* carrier-mounted modem the USOC for Permissive mode is RJ21X. The Canadian equivalent to the USOC is CA21A.

Warranty, Sales, and Service Information

Contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- **Via the Internet:** Visit the Paradyne World Wide Web site at http://www.paradyne.com
- **Via Telephone:** Call our automated call system to receive current information via fax or to speak with a company representative.
  - — Within the U.S.A., call 1-800-870-2221
  - — Outside the U.S.A., call 1-727-530-2340

Trademarks

All products and services mentioned herein are the trademarks, service marks, registered trademarks or registered service marks of their respective owners.

Document Feedback

We welcome your comments and suggestions about this document. Please mail them to Technical Publications, Paradyne Corporation, 8545 126th Ave. N., Largo, FL 33773, or send e-mail to userdoc@eng.paradyne.com. Include the number and title of this document in your correspondence. Please include your name and phone number if you are willing to provide additional clarification.

Printed on recycled paper

COPYRIGHT © 1998, 2002 Paradyne Corporation. All rights reserved.

This publication is protected by federal copyright law. No part of this publication may be copied or distributed, transmitted, transcribed, stored in a retrieval system, or translated into any human or computer language in any form or by any means, electronic, mechanical, magnetic, manual or otherwise, or disclosed to third parties without the express written permission of Paradyne Corporation, 8545 126th Avenue North, P.O. Box 2826, Largo, Florida 33779-2826.

Paradyne Corporation makes no representation or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for a particular purpose. Further, Paradyne Corporation reserves the right to revise this publication and to make changes from time to time in the contents hereof without obligation of Paradyne Corporation to notify any person of such revision or changes.

Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
3. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
4. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
5. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
6. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
7. Input power to this product must be provided by one of the following: (1) a UL Listed, CSA Certified power source with a Class 2 or Limited Power Source (LPS) output for use in North America, or (2) a certified power source with a Safety Extra Low Voltage (SELV) output for use in the country of installation.
8. In addition, if the equipment is to be used with telecommunications circuits, take the following precautions:
   - Never install telephone wiring during a lightning storm.
   - Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
   - Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
   - Use caution when installing or modifying telephone lines.
   - Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
   - Do not use the telephone to report a gas leak in the vicinity of the leak.

Notices

WARNING

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES. THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

THE AUTHORITY TO OPERATE THIS EQUIPMENT IS CONDITIONED BY THE REQUIREMENTS THAT NO MODIFICATIONS WILL BE MADE TO THE EQUIPMENT UNLESS THE CHANGES OR MODIFICATIONS ARE EXPRESSLY APPROVED BY PARADYNE.

WARNING

TO USERS OF DIGITAL APPARATUS IN CANADA:

THIS CLASS A DIGITAL APPARATUS MEETS ALL REQUIREMENTS OF THE CANADIAN INTERFERENCE-CAUSING EQUIPMENT REGULATIONS.

CET APPAREIL NUMÉRIQUE DE LA CLASSE A RESPECTE TOUTES LES EXIGENCES DU RÈGLEMENT SUR LE MATÉRIEL BROUILLEUR DU CANADA.

Government Requirements and Equipment Return

Certain governments require that instructions pertaining to modem connection to the public switched telephone network be included in the installation and operation manual. Specific instructions are listed in the following sections.

Note that 3810*Plus* and 3811*Plus* are the model names for the model numbers 3980 and 3981, respectively. The modems collectively are called 3800*Plus* modems.

United States

Notice to Users of the Public Switched Telephone Network

1. This equipment complies with Part 68 of the FCC rules. On the equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. The label is located on the bottom of the Model 3810*Plus* modem and on the circuit card assembly of the Model 3811*Plus*. If requested, this information must be provided to the telephone company.

2. Page A of this manual contains the Universal Service Order Codes (USOC) associated with the services on which the equipment is to be connected.

3. The Ringer Equivalence (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum RENs for the calling area.

4. If the 3800*Plus* modem causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

6. If you experience trouble with this equipment, please contact your sales or service representative (as appropriate) for repair or warranty information. If the product needs to be returned to the company service center for repair, contact them directly for return instructions using one of the following methods:

   - **Via the Internet:** Visit the Paradyne World Wide Web site at http://www.paradyne.com
   - **Via Telephone:** Call our automated call system to receive current information via fax or to speak with a company representative.
     - — Within the U.S.A., call 1-800-870-2221
     - — Outside the U.S.A., call 1-727-530-2340

   If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved.

7. The user is not authorized to repair or modify the equipment.

8. This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

9. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such a message clearly contains, in a margin at the top or bottom of each transmitted page, or on the first page of the transmission, the date and time it is sent, and an identification of the business, or other entity, or other individual sending the message, and the telephone number of such business, or other entity, or individual.

   In order to program this information, follow the steps outlined in the manual supplied with your fax software.

10. An FCC compliant telephone cord with modular plugs may be provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant.

Canada

Notice to Users of the Canadian Public Switched Telephone Network

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone line and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Load Number for this equipment is on the label on the modem. The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all devices does not exceed 100.

If your equipment is in need of repair, refer to the procedure in the *Government Requirements and Equipment Return* section.

Table of Contents

Preface

Objectives and Reader Assumptions vii
How to Use This Manual vii
Related Documents viii

1. Introduction

Overview 1-1
Features 1-1
COMSPHERE Models 1-2
SDC Feature 1-2
Options 1-2
Optional ETC Feature 1-2

2. 3810*Plus* Installation

Overview 2-1
3810*Plus* Modem Package 2-1
3810Plus Modem Installation 2-2
DTE Connection 2-3
Dial-Line Connection 2-4
3810*Plus* 4-Wire/2-Wire Leased-Line Network Connection 2-4
AC Power Supply Connection 2-4
Network Management System Connection 2-5
Modem Power-Up 2-5
Removing and Replacing 3810*Plus* Modems 2-6

3. 3811*Plus* Installation

Overview 3-1
3811*Plus* Modem Package 3-1
3811*Plus* Modem Installation 3-2
Removing and Replacing 3811*Plus* Modems 3-4

4. Front Panel Operation

Overview 4-1
Diagnostic Control Panels 4-1
Status Indicators 4-2
DCP Operation 4-4
Menu Structure 4-6
Selecting Factory Configuration Options 4-11

5. Call Setup Branch

Overview 5-1
Call Setup Branch 5-2

6. Status Branch

Overview 6-1
Status Branch 6-1

7. Test Branch

Overview 7-1
Test Branch 7-2

8. Configure Branch

Overview 8-1
Configure Branch 8-4
Configuration Tables 8-7
Security Configuration Options 8-46

9. Control Branch

Overview 9-1
Control Branch 9-1
Automatic Firmware Download 9-6

10. Remote Branch

Overview 10-1
Remote Branch 10-1

11. Security

Overview 11-1
Security Branch 11-4
Security Password Entry Techniques 11-11
Database Table Examples 11-12

12. Fax Operation

Overview 12-1
Fax Operation 12-1

13. AT Command Set and S-Registers

Overview 13-1
Operating Modes 13-1
Command Guidelines 13-1
AT Command List 13-2
S-Register List 13-18

Appendices

A. Menu Tree A-1
B. Result Codes B-1
C. Troubleshooting C-1
D. Technical Specifications D-1
E. Pin Assignments E-1
F. ITU-T V.25bis Dialing Commands and Responses F-1
G. Default Configuration Options G-1
H. Equipment List H-1
I. Synchronous Data Compression I-1

Glossary

Index

This page intentionally left blank.

List of Figures

Figure		Page
2-1	3810*Plus* Modem	2-2
2-2	3810*Plus* Rear Panel	2-3
2-3	3600 Hubbing Device	2-5
3-1	3811*Plus* Modem	3-2
3-2	Installing a 3811*Plus* Modem	3-3
4-1	3810*Plus* Front Panel	4-1
4-2	Optional SDCP, 3811*Plus* Faceplate, and Optional SDU	4-2
4-3	3800*Plus* LCD and Keypad	4-4
5-1	Dial Backup	5-3
7-1	Local Analog Loopback	7-3
7-2	Remote Digital Loopback	7-4
7-3	Local Digital Loopback	7-5
7-4	Pattern Test and Local Analog Loopback Test	7-6
7-5	Pattern Test and Remote Digital Loopback Test	7-6
7-6	End-to-End Pattern Test	7-6
8-1	DCP Configuration Process	8-2
8-2	AT Command Configuration Process	8-3
E-1	VF Pin Orientation	E-3
E-2	Wiring Diagram — 8-Position to 6-Position Crossover Cable	E-4

List of Tables

Table		Page
4-1	3800*Plus* DCP LEDs	4-3
4-2	SDCP LEDs	4-4
4-3	Top Level Menu Status	4-7
4-4	Common Operational Messages	4-10
4-5	Dial Access Security Messages	4-10
5-1	Valid Dial Command Modifier	5-6
8-1	DTE Interface Configuration Options	8-7
8-2	DTE Dialer Configuration Options	8-14
8-3	Line Dialer Configuration Options	8-19
8-4	Dial Line Configuration Options	8-24
8-5	Leased Line Configuration Options	8-28
8-6	V.42/MNP/Buffer Configuration Options	8-33
8-7	Test Configuration Options	8-41
8-8	Miscellaneous Configuration Options	8-43
8-9	Security Configuration Options	8-46
11-1	Edit Password Table Group Options	11-7
11-2	Set Answer Security Group Options	11-8
11-3	Set Originate Security Group Options	11-9
11-4	Security Database Table Using VF-Side Passwords	11-12
11-5	Security Database Table Using DTE-Side Password	11-13
11-6	Security Database Table Using Both VF-Side and DTE-Side Password	11-13
11-7	Security Database Table Using Paired VF-Side and DTE-Side Passwords	11-14
13-1	3800*Plus* AT Commands	13-3
13-2	3800*Plus* S-Registers	13-18
B-1	Result Codes	B-1
C-1	Modem Integrity	C-1
C-2	Modem – DTE Connection	C-2
C-3	Modem – VF Connection	C-2
C-4	Online Operation	C-4
C-5	Leased-Line Operation	C-4
C-6	Dial Backup Operation	C-4
D-1	Technical Specifications for COMSPHERE 3800*Plus* Modems	D-1
E-1	EIA-232-D Pin Assignments	E-2
E-2	VF Connector Pin Assignments	E-3
F-1	V.25bis Commands	F-4
F-2	V.25bis Response Messages	F-4
G-1	Factory Default Configuration Options	G-1
I-1	SDC Negotiation Configuration Scenarios	I-3
I-2	SDC Performance Measurements	I-3

Preface

Objectives and Reader Assumptions

This manual describes how to install and operate the 3810*Plus* (standalone) and 3811*Plus* (carrier-mounted) modems. The reader is assumed to have a basic understanding of modems and their operation.

How to Use This Manual

Chapter 1 provides information about the features of 3800*Plus* modems.

Chapter 2 provides instructions for installing 3810*Plus* modems.

Chapter 3 provides instructions for installing 3811*Plus* modems.

Chapter 4 provides the information required to operate the Model 3810*Plus* using the front panel and the Model 3811*Plus* using the COMSPHERE 3000 Series Carrier's shared diagnostic control panel (SDCP).

Chapters 5 through 11 describe the seven branches of the front panel command sets:

- Chapter 5 describes the Call Setup branch.
- Chapter 6 describes the Status branch.
- Chapter 7 describes the Test branch.
- Chapter 8 describes the Configure branch.
- Chapter 9 describes the Control branch.
- Chapter 10 describes the Remote branch.
- Chapter 11 describes the Security branch.

Chapter 12 provides general information about operating 3800*Plus* modems in fax mode.

Chapter 13 provides instructions for displaying and changing AT commands and S-Registers.

Appendix A provides a menu tree for 3800*Plus* modems.

Appendix B provides a list and description of result codes issued by 3800*Plus* modems.

Appendix C provides instructions for performing diagnostic tests when data communications problems occur.

Appendix D provides technical specifications for 3800*Plus* modems.

Appendix E provides EIA RS-232 and VF TELCO pin assignments, and auxiliary cable diagrams.

Appendix F provides V.25bis dialing information.

Appendix G provides a list of all default configuration options available for the four non-cellular factory preset configurations: Async Dial, Sync Dial, Sync Leased, and UNIX Dial.

Appendix H is an equipment list for 3800*Plus* modems, including optional features and cables.

Appendix I describes the Synchronous Data Compression (SDC) feature.

The Glossary provides a description of terms used throughout this manual.

Related Documents

3000-A2-GA31	*COMSPHERE 3000 Series Carrier, Installation Manual*
3610-A2-GZ45	*3600 Hubbing Device, Feature Number 3600-F3-300, Installation Instructions*
3980-A2-GZ41	*COMSPHERE 3811Plus Modem Installation Instructions*
6700-A2-GY31	*COMSPHERE 6700 Series Network Management System User's Guide*

Contact your sales or service representative to order additional product documentation.

Paradyne documents are also available on the World Wide Web at:

http://www.paradyne.com

Select *Service & Support* → *Technical Manuals*

Introduction 1

Overview

The COMSPHERE® 3810*Plus* and 3811*Plus* modems, extensions of the award-winning COMSPHERE 3800 Series, are a new generation of full-feature, high-speed dial modems that offer reliable asynchronous and synchronous operation over dial- or leased-lines networks. The 3800*Plus* modems' software defineability allows for the addition of future enhancements and features.

Through their downloading capability, 3800*Plus* modems can be upgraded to the latest firmware, requiring no new hardware investment or on-site personnel, and little or no downtime. These modems support a wide range of modulation schemes and offer control using either AT commands, the user-friendly diagnostic control panel (DCP) or the optional COMSPHERE 6700 Series Network Management System (NMS). The NMS performs extensive monitoring, testing, reporting, and restoral functions to assist in managing your network.

High-speed data transfer and reliable throughput at line rates as high as 33,600 bps over dial lines is achieved by employing the latest techniques in ITU-T V.42bis/MNP Class 5 data compression and ITU-T V.42/MNP error correction. The modems can send data to the DTE at speeds as high as 115,200 bps (in asynchronous mode) or 128,000 bps (synchronous mode).

The 3800*Plus* modem is extremely versatile when used in modem pooling environments; it allows multiple users to temporarily customize modem settings, thereby permitting communication with the calling modem. Upon disconnection, the 3800*Plus* modem falls back to its original configuration settings and resumes normal operation.

The modem's compatibility with a number of dialing methods and protocols, such as asynchronous AT commands, ITU-T V.25bis dialing, and the user-friendly diagnostic control panel (DCP), permits the 3800*Plus* modem to be used in a variety of applications and environments while also allowing control over modem configuration, dialing, and diagnostics. The 3800*Plus* modems offer preset factory configurations containing the most often used modem settings. These factory presets provide quick configuration for any asynchronous or synchronous dial, synchronous leased, UNIX hardware-based dial, or cellular environments.

The 3810*Plus* is a 4-wire/2-wire standalone modem; the 3811*Plus* is a carrier-mounted version of the 3810*Plus*.

Features

The 3800*Plus* modems have a wide variety of features.

- Dial-Line Modulations: ITU-T V.34 (up to 33,600 bps), V.32*terbo* (19,200 and 16,800 bps), ITU-T V.32bis (up to 14,400 bps), V.32 (up to 9600 bps), V.22bis (2400 bps), V.22 (1200 bps), V.21 (300 bps), Bell 212A (1200 bps), and Bell 103J (300 bps).
- Four-wire Leased-Line Modulations: ITU-T V.34 (up to 33,600 bps), V.32*terbo* (19,200 and 16,800 bps), V.32bis (14,400, 12,000, 9600, 7200, and 4800 bps), V.32 (9600 and 4800 bps), and V.22bis (2400 bps).
- Two-wire Leased-Line Modulations: ITU-T V.34 (up to 33,600 bps), V.32*terbo* (19,200 and 16,800 bps), V.32bis (14,400, 12,000, 9600, 7200, and 4800 bps), V.32 (9600 and 4800 bps), and V.22bis (2400 bps).

- Class 1 and Class 2 Group III Fax modulations: ITU-T V.17 (14,400, 12,000, 9600, and 7200 bps), V.29 (9600 and 7200 bps), and V.27ter (4800 and 2400 bps).
- Convenient migration to new or optional features through software downloading.
- ITU-T V.42bis and MNP Class 5 data compression.
- Virtual error free data integrity with ITU-T V.42 and MNP Level 4 error control.
- Automatic and manual single call dial backup and dial standby capabilities for 2-wire and 4-wire leased-line applications.
- A unique Paradyne modem pooling feature that preserves the answering modem's permanent configuration, but allows multiple users to temporarily adapt parameters for individual requirements.
- Dial-line data rates from 300 bps–33,600 bps. Leased-line rates from 2400 bps–33,600 bps.
- Asynchronous dial DTE data rates from 300 bps–115,200 bps.
- A diagnostic control panel (DCP) that displays the connect status, data rate, type of error control or compression, test results, alarm status of DTE or VF parameters for both local and remote modems.
- Storage of up to 10 telephone numbers to directory locations.
- Compatibility with the industry *de facto* standard AT Command set.
- Dialing via DCP, AT commands, DTR, or ITU-T V.25bis commands.
- Configuration of software options via the AT Command set or DCP.
- High-speed transmission using asynchronous, synchronous, or UNIX devices over full- or half-duplex dial networks or 2-wire/4-wire leased lines.
- Complement of self-tests, local and remote loopbacks including ITU-T compatible V.54.
- Seven factory-defined configurations and two user-defined configuration areas.
- Originate Security and three Answer Security modes which guard against unwanted user access to the host DTE.
- Directory #1 Callback capability.

COMSPHERE Models

The COMSPHERE high-speed modem is available in two models.

- The 3810*Plus*, a 4-wire/2-wire standalone unit capable of operation on 2-wire dial, or 4-wire leased or 2-wire leased lines.
- The 3811*Plus*, a 4-wire/2-wire carrier-mounted modem for installation into a COMSPHERE 3000 Series Carrier; it is capable of operation on dial, or 4-wire leased or 2-wire leased lines.

SDC Feature

The Paradyne proprietary Synchronous Data Compression (SDC) feature allows an increase of throughput in data transmission, and has an error correcting procedure so that transmitted data is less sensitive to channel disturbances.

SDC can be used with V.34 and V.32 family modulations on dial or leased lines, and in a dial backup or standby mode. See Appendix I, *Synchronous Data Compression*, for more information.

Options

3800*Plus* modems also may have the following optional features:

- Leased-Line Modulations: ITU-T V.33 (14,400 and 12,000 bps) and ITU-T V.29 (9600, 7200, and 4800 bps).
- Extended Security, permitting up to 3,000 passwords (3811*Plus* only).
- ETC (Enhanced Throughput Cellular)

Optional ETC Feature

Enhanced Throughput Cellular (ETC) is a technology that improves connection speed, transmission rates, and reliability over analog cellular networks. ETC must be installed on both sides of the connection.

3810*Plus* Installation 2

Overview

The standalone 3810*Plus* modem (Figure 2-1) is capable of either dial or 4-wire/2-wire leased-line operation. It is controlled using AT commands or the diagnostic control panel (DCP). The DCP consists of an LCD which displays selections, three function keys and four directional keys which allow you to maneuver and choose DCP selections, and a row of 13 LED status indicators which display modem activity. For a better understanding of DCP operation, refer to Chapter 4, *Front Panel Operation*.

The rear of the 3810*Plus* modem contains an ON/Off power switch, a low voltage power connector, an 8-pin modular jack for leased-line connection, an 8-pin modular jack for dial-line connection, a 4-pin modular jack for network management, and a DB-25-S DTE connector.

3810*Plus* Modem Package

After opening the modem's package, check for damage and verify that the following items are present:

- 3810*Plus* modem
- Power supply
- One 6-position modular cord (in selected models)
- One 8-position modular cord (in selected models)
- Quick Reference

If any hardware components are damaged, notify your service representative. Return equipment using procedures described in the *Government Requirements and Equipment Return* section near the beginning of this book.

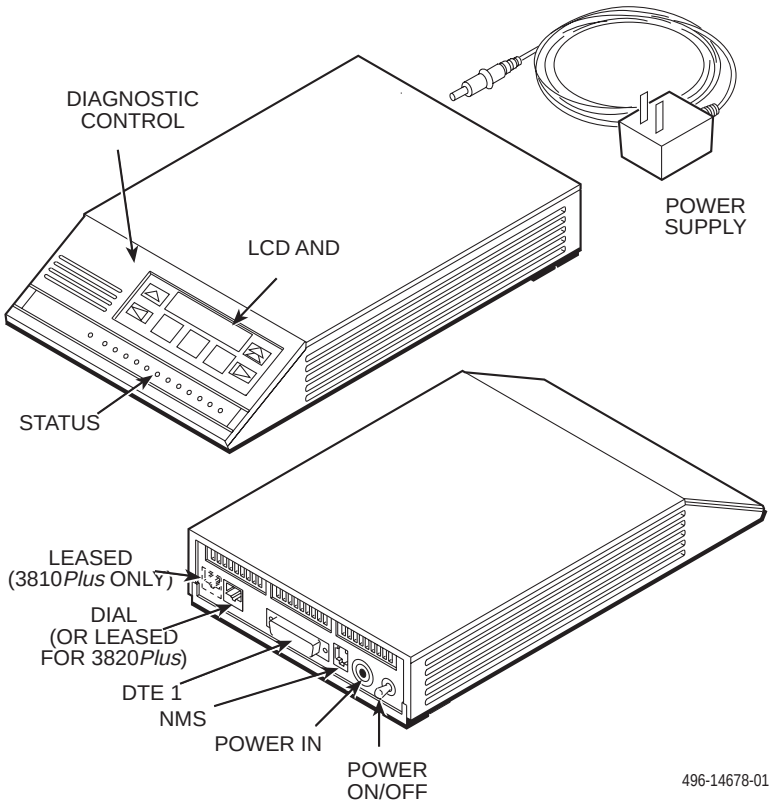


Figure 2-1. 3810*Plus* Modem

Customer-Supplied Equipment

The following customer-supplied equipment may be required to complete a data communications system using the 3810*Plus* modem:

- A DTE with an available RS-232D serial port.
- A standard RS-232D cable with a male DB-25-S connector at one end to attach to the modem.
- One of the following modular dial or leased network interfaces:
  - — RJ11C for dial permissive applications
  - — JM8 for leased-line applications

3810*Plus* Modem Installation

Before installing your standalone modem, make sure your installation site is clean and well-ventilated. Allow space around the modem for installing cables and telephone line cords, and make sure the modem is located within reach of the ac power outlet. The distance between your modem and DTE should be minimized if DTE data rates exceed 19,200 bps. Also, low capacitance cables may be necessary for speeds greater than 19,200 bps or distances greater than 50 feet.

The rear panel of a 3810*Plus* modem has the following switches and connectors (see Figure 2-2):

- An ON/Off power switch.
- A barrel-type power receptacle for a wall-mount transformer, or an 8-pin DIN type power receptacle for a table-top power supply.
- An 8-pin modular keyed jack for 4-wire/2-wire leased lines.

- An 6-pin modular keyed jack for dial (PSTN) lines.
- A 4-pin modular jack for network management system (NMS) connection.
- A 25-pin DB-25-S receptacle for DTE interface.

Connecting 3810*Plus* Modems with Supplied Cables

Figure 2-2 shows how 3810*Plus* modems are connected to certain TELCO jack types using the supplied cables. For other TELCO connections, refer to Appendix D.

1. Make sure the modem's rear panel power switch is Off.
2. Connect the DB-25-P (male) connector on the cable to the DB-25-S (female) connector labeled DTE 1 (Figure 2-2) on the modem's rear panel. Use a small screwdriver to tighten the cable to the modem.
3. Connect the DB-25-P connector on the cable to the DB-25-S connector on the DTE. Use a small screwdriver to tighten the cable to the DTE.

DTE Connection

Use the following procedure to connect the RS-232D cable from the modem to the DTE:

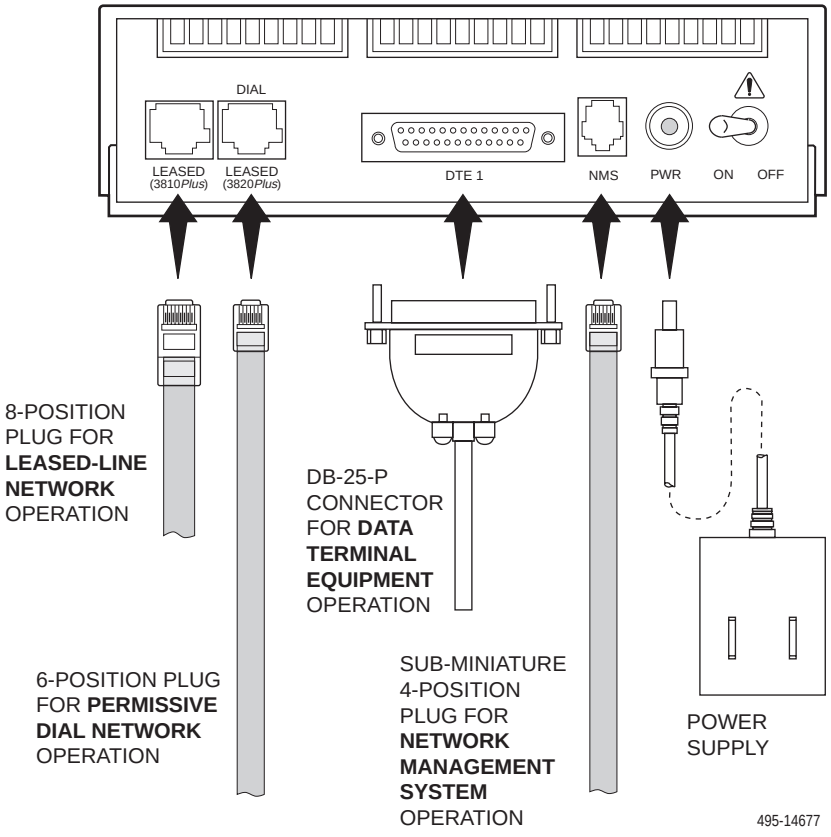


Figure 2-2. 3810*Plus* Rear Panel

Dial-Line Connection

Use the following procedure to connect the 3810*Plus* modem to the dial network interface:

1. Insert the 6-position, 4-conductor modular plug into the jack labeled DIAL/LEASED (Figure 2-2).

2. Insert the other end of the modular cord into the dial network interface (“demarc”).

3810*Plus* 4-Wire/2-Wire Leased-Line Network Connection

Use the following procedure to connect a 3810*Plus* modem to the leased-line network interface:

1. Insert the 8-position, 8-conductor modular plug into the jack labeled LEASED (Figure 2-2).

2. Insert the other end of the modular cord into the leased-line network interface (“demarc”).

3. If you intend to use dial backup, follow steps listed in *Dial-Line Connection*.

AC Power Supply Connection

WARNING

Power supplies from other modems may fit into the POWER connector, but connecting the wrong power supply can cause damage to the modem or the power supply.

Use the following procedure to connect the modem to an ac power outlet:

1. Make sure the modem’s power switch is in the Off position.

2. Insert the power transformer’s cylindrical connector into the modem’s rear panel power receptacle (Figure 2-2).

3. If your modem is equipped with a tabletop power supply, plug the power cable into the power supply.

4. Connect the power supply to a grounded ac power outlet.

Network Management System Connection

For the 3810*Plus* modem, use the following procedure to connect the modem to the network management system interface:

1. Insert the subminiature 4-position, 4-conductor modular plug of the 3600 Hubbing Device (Figure 2-3) into the jack labeled NMS (Figure 2-2).

2. Connect the 3600 Hubbing Device to the network management system.

Refer to the *3600 Hubbing Device, Feature Number 3600-F3-300, Installation Instructions* for more information. Installation for the 3810*Plus* modem is the same as for the 3610 DSU.

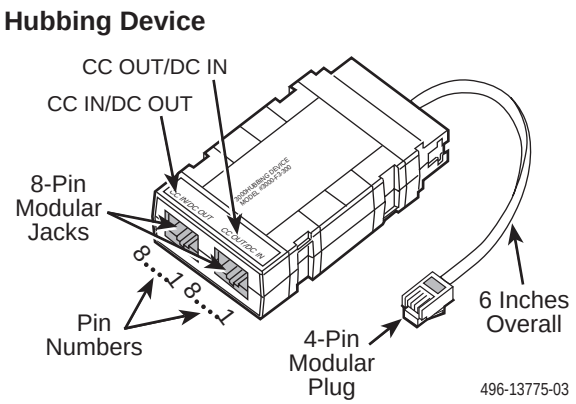
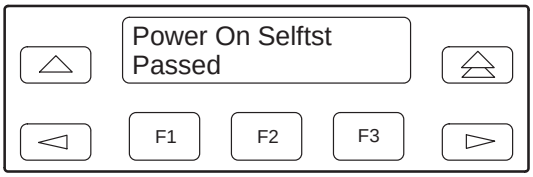


Figure 2-3. 3600 Hubbing Device

Modem Power-Up

Once your modem is properly connected to the DTE, dial and/or leased lines, and ac outlet, press the modem's rear panel power switch to the ON position. The modem begins a power-up self-test. This test takes several seconds to perform, and verifies the operation of most hardware components within the modem. If successful, the LCD displays **Power On Selftst Passed** and continues to the Top-Level menu screen.



If a failure occurs during the self-test, the LCD may display **Power On Selftst Failed** for several seconds. The LCD then may display the Top-Level menu screen with the message **Power on Fail** appearing on the top line of the LCD. Although a failure has occurred, the modem may attempt to operate. If it does, you can activate a more thorough self-test using the Test branch. Refer to Chapter 7, *Test Branch*.

Removing and Replacing 3810*Plus* Modems

To remove and replace a 3810*Plus* modem, perform the following steps:

1. Make sure the modem is offline, and toggle the modem's rear panel power switch to the Off position.

2. Disconnect the power cord from the ac power outlet, and then from the connector on the rear of the modem.

3. Disconnect the dial and leased-line modular cords from the modem's rear panel.

4. Disconnect the DTE interface cable from the modem's rear panel.

   If the modem is to be removed for service, return it to the company using the procedures described in *Government Requirements and Equipment Return* near the beginning of this book.

5. Install the replacement modem as described in the *3810Plus Modem Installation* section of this chapter, and configure it the same way as the modem being replaced.

3811*Plus* Installation 3

Overview

The carrier-mounted 3811*Plus* modem (Figure 3-1) is capable of dial or 4-wire/2-wire leased-line operation and resides in a COMSPHERE 3000 Series Carrier. The faceplate of the 3811*Plus* has 16 LED status indicators for displaying modem activity and an audio speaker jack for the carrier's optional speaker.

The 3811*Plus* modem's backplate has two DTE edge card connectors that mount into a connector plate located on the rear of the carrier. This connector plate has two DB-25-S connectors. One provides an RS-232D DTE interface, and the other is unused. The 3811*Plus* derives ac power from the COMSPHERE 3000 Series Carrier's backplane, which is a common bus to all devices installed in the carrier. The user interface with any 3811*Plus* is the shared diagnostic control panel (SDCP), an optional feature similar to the DCPs on the 3810*Plus*. For a better understanding of DCP operation, refer to Chapter 4, *Front Panel Operation*.

The COMSPHERE 3000 Series Carrier has a total of 17 slots. The first slot, Slot 0, is reserved for the shared diagnostic unit (SDU) while the remaining 16 slots can house up to 16 3811*Plus* modems, or for mixed networks, a combination of 3811*Plus* modems and other Paradyne access products, such as Model 3611 data service units. An SDU is a circuit card that provides SDCP and network management interfaces to access products installed in the carrier. SDUs are only required if a single SDCP is used by multiple COMSPHERE 3000 Series Carriers in a cabinet, or if a network management system (NMS) is used.

For more details on the COMSPHERE 3000 Series Carrier, refer to the *COMSPHERE 3000 Series Carrier, Installation Manual*.

3811*Plus* Modem Package

After opening the modem's package, check for damage and verify that the following items are present:

- 3811*Plus* modem
- Rear connector plate with DB-25-P edge card connector

If any hardware components are damaged, notify your service representative. Return equipment using procedures described in the *Government Requirements and Equipment Return* section near the beginning of this book.

Customer-Supplied Equipment

The following customer-supplied equipment may be required for the installation of a 3811*Plus* modem:

- A COMSPHERE 3000 Series Carrier.
- A Shared Diagnostic Unit (SDU, required for network management applications and multiple carriers).
- Two 50-pin mass termination cables, one Network Interface Module (NIM) for modems installed in Slots 1–8, and one NIM for modems installed in Slots 9–16 (required for dial-line applications).
- One of the following dial or leased network interfaces:
  - — 50-pin to modular cable (RJ11C) for dial permissive applications
  - — 50-pin to modular cable (JM8) for leased line applications
- One 6-position to 6-position modular cord (required for network management applications).
- A Shared Diagnostic Control Panel (SDCP).

If the modem is to be managed by a network management system, an SDU must be supplied and properly connected to the network management controller. For proper network management connection to the SDU, refer to the appropriate network management system user's guide.

For installation of the 3000 Series Carrier into a cabinet, refer to the *COMSPHERE 3000 Series Carrier, Installation Manual*.

3811*Plus* Modem Installation

The 3811*Plus* modem is designed for installation in a COMSPHERE 3000 Series Carrier which supplies operating power and the dial and/or leased-line network connections. **For correct power, DTE, dial-line, leased-line, NIM, and network management cabling information, refer to the *COMSPHERE 3000 Series Carrier, Installation Manual*.**

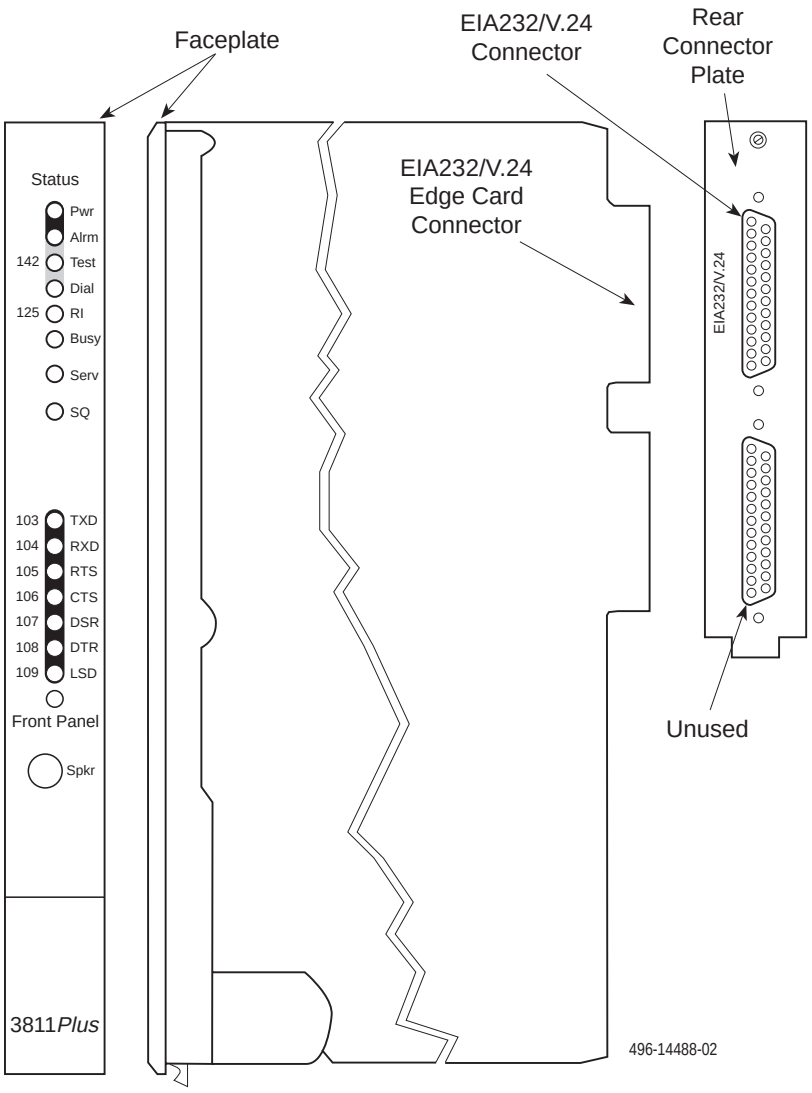


Figure 3-1. 3811*Plus* Modem

The installation of a 3811*Plus* varies slightly if an SDCP is installed on the front of the carrier. To install a 3811*Plus* modem into the carrier without an SDCP, perform the following steps:

CAUTION

If you remove the 3811*Plus* from the carrier, always use a ground strap when handling the modem. Always store the 3811*Plus* in an antistatic bag when it is removed from the carrier.

1. At the rear of the carrier, install the rear connector plate. Make sure the plate uses the same slot position as that intended for the modem.

   Loosely fasten the plate. This allows for slight adjustments later when installing the modem.

2. At the front of the carrier, hold the modem vertically, with the latch on its faceplate in the open position, and insert it into the top and bottom card guides of one of the slots numbered 1–16 (see Figure 3-2).

   Slide the modem into the slot, aligning the modem with the rear connector plate, until the backplane connector and DTE connector seat firmly into the back of the carrier. The faceplate latch automatically closes as you push the modem into the carrier. To lock the modem into the carrier, press the faceplate latch until a click is heard.

3. If the carrier is connected to power, the **Power** LED on the faceplate of the 3811*Plus* lights up. After several seconds the modem completes its power-up self-test in which all faceplate LEDs light up. If the modem fails, or an alarm condition exists, the **Alrm** LED on the faceplate lights up or flashes.

   Return to the rear of the carrier and tighten the rear connector plate.

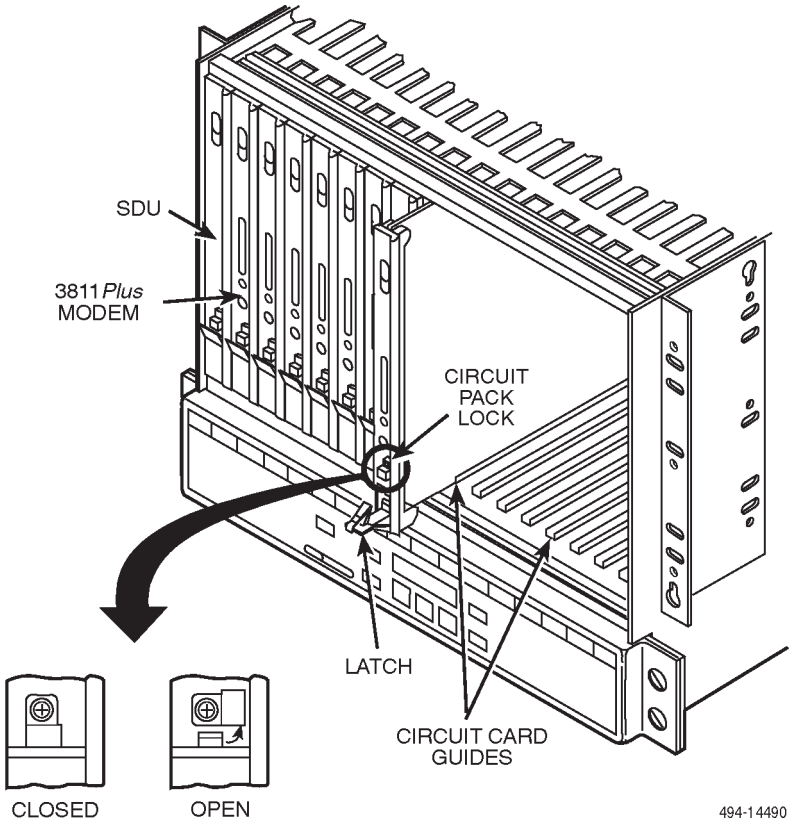


Figure 3-2. Installing a 3811*Plus* Modem

If the modem is to communicate with an installed SDCP, install the modem as described above and perform the following steps:

1. Press the Select key on the SDCP. The cursor appears in the carrier selection entry.

2. Press the F1 (↑) or F2 (↓) key until the carrier number you want appears on the LCD.

   The carrier number selection has a range of 1 to 8 since a single SDCP can control a configuration of up to eight carriers. (This is only possible if the SDU is installed.)

3. Press the ▻ key to position the cursor on the slot selection entry.

4. Press the F1 (↑) or F2 (↓) key until the slot number (1–16) you want appears on the LCD. Ignore the AB designator that appears on the LCD since it is not applicable to the 3811*Plus* modem.

5. Press the Select key to place the SDCP in direct communication with the selected modem.

   The LCD displays the Top-Level menu for the selected modem. In addition, the Front Panel LED on the modem's faceplate lights up.

6. Once you have determined that the modem is installed properly and completed its power-up self-test, rotate the circuit pack lock until it covers the faceplate latch (Figure 3-2). This prevents the modem from accidently being removed once it is installed in a carrier.

Removing and Replacing 3811*Plus* Modems

It is not necessary to power down the carrier to remove and replace a 3811*Plus* modem. Perform the following steps:

CAUTION

If you remove the 3811*Plus* modem from the carrier, always use a ground strap when handling the modem. Always store the 3811*Plus* in an antistatic bag when it is removed from the carrier.

1. Rotate the circuit pack lock until the release tab is exposed.

2. Press down on the release tab and pull the modem away from the carrier's backplane.

Front Panel Operation 4

Overview

This chapter describes how to use the diagnostic control panel (DCP) of the 3800*Plus* modem.

Diagnostic Control Panels

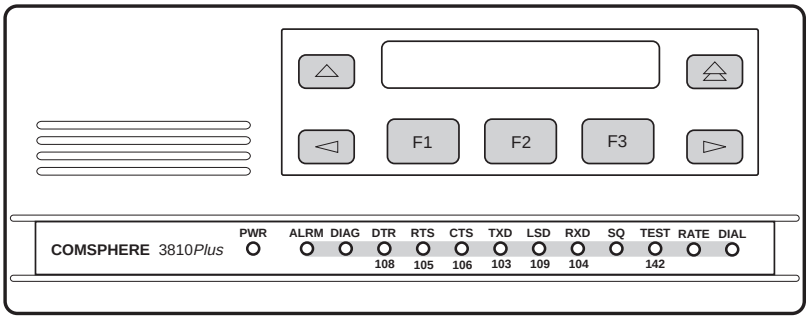
There are two types of DCPs: the front panel on the standalone 3810*Plus* modem, and the shared diagnostic control panel (SDCP), an optional feature used with a 3811*Plus* modem installed in a COMSPHERE 3000 Series Carrier. Both DCPs have a 2-line, 32-character liquid crystal display (LCD) and keypad through which Top-Level menu branches are accessed to perform the following:

- Initiate and disconnect dial operations
- Check modem status
- Set up configuration options
- Initiate diagnostic tests
- Access remote modems through the local modem's DCP

The LCD displays the result of any command initiated using the DCP. Most of these operations can be performed from an attached asynchronous DTE using the AT command set.

3810*Plus* DCP

The DCP of the 3810*Plus* modem (Figure 4-1) contains status indicators, pushbutton-type keys, and an LCD.



496-14486-01

Figure 4-1. 3810*Plus* Front Panel

3811*Plus* Faceplate and Shared Diagnostic Control Panel (SDCP)

The shared diagnostic control panel (SDCP) is used to manage carrier-mounted 3811*Plus* modems. Use the SDCP to issue commands to view and select configuration options on, or to monitor tests for, a specific 3811*Plus* modem.

The faceplate of the 3811*Plus* contains LED status indicators that monitor the operation of the modem. After the SDCP is connected to the modem, the Front Panel indicator of the selected modem lights to show that the modem is connected.

Figure 4-2 shows the SDCP and the shared diagnostic unit (SDU) it interfaces with.

Status Indicators

The status indicators on a 3800*Plus* modem continuously provide information on the modem's operating condition. All of the status indicators on the 3810*Plus* modem are on the DCP (Figure 4-1), whereas the status indicators for the carrier-mounted 3811*Plus* modem are located on its faceplate, the SDCP, and the SDU faceplate (Figure 4-2).

The standalone 3810*Plus* modem's DCP has 13 LEDs, and the carrier-mounted 3811*Plus* has 16 LEDs. These LEDs are listed and described in Table 4-1; LEDs specific to one model type have the appropriate model number shown in the table.

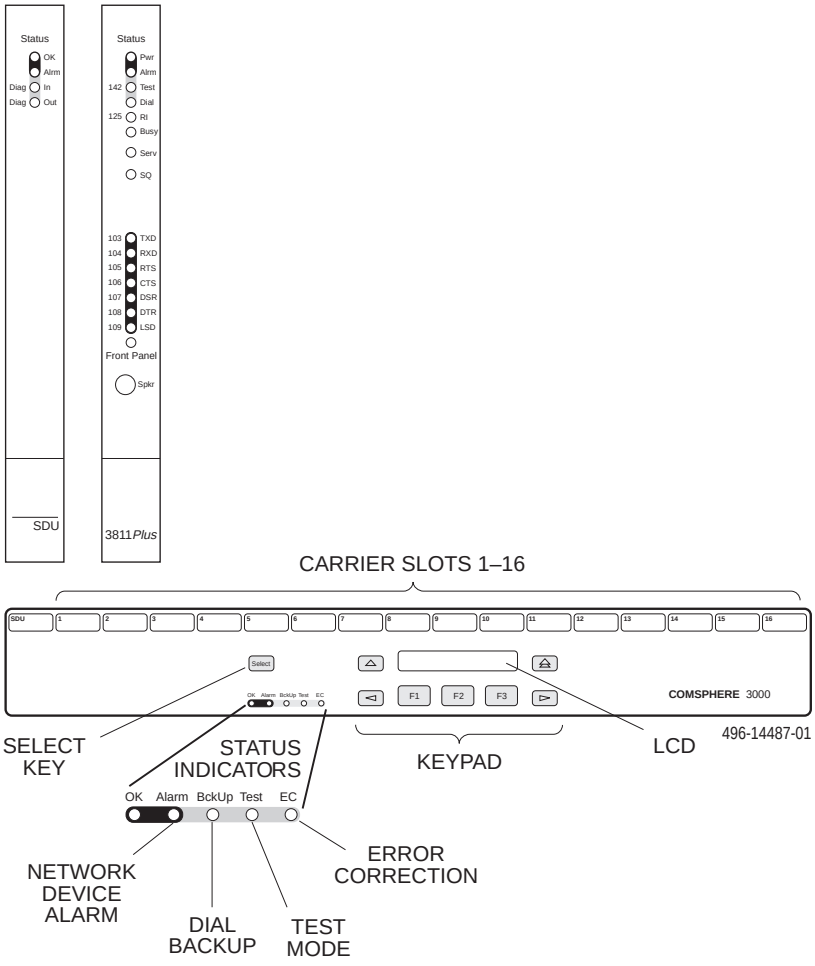


Figure 4-2. Optional SDCP, 3811*Plus* Faceplate, and Optional SDU

Table 4-1
3800*Plus* DCP LEDs

Label	Color	Indicates
Pwr	green	ON – Power is on and the modem is capable of operating.
Alrm	red	Flashing – A malfunction has been detected in either the modem or COMSPHERE 3000 Series Carrier.
Diag (3810*Plus* only)	green	The modem has responded to a diagnostic command from network management.
Test/142	yellow	The modem is involved in a test. Normal operation is not possible.
Dial	green	Quick Flashing – The modem is attempting to establish a call over the dial network. Slow Flashing – The modem is in Dial Standby mode. ON – The modem has established a dial connection. OFF – A dial connection does not exist.
RI/125 (3811*Plus* only)	green	A ringing signal is being received.
Busy (3811*Plus* only)	yellow	ON – The modem is placed in a forced busy condition and is off-hook.
Serv (3811*Plus* only)	yellow	ON – The modem is connected to the carrier service line rather than the normally assigned dial network.
SQ	yellow	The receive telephone line signal is degraded.
TXD/103	green	The modem is receiving data from the DTE to transmit. (ON equals space.)
RXD/104	green	Data is being transferred to the DTE. (ON equals space.)
RTS/105	green	RTS signal is ON.
CTS/106	green	CTS signal is ON, or the modem is configured to force ON CTS, or AT commands are enabled.
DSR/107 (3811*Plus* only)	green	DSR signal is ON, or the modem is configured to force ON DSR.
DTR/108	green	The DTE has turned ON DTR, or the modem is configured to ignore DTR.
LSD/109	green	The modem has detected a valid carrier signal and is capable of transferring data to the DTE, or the modem is configured to force ON LSD.
Front Panel (3811*Plus* only)	yellow	ON – The modem is connected to the carrier's SDCP.
Rate (3810*Plus* only)	yellow	ON – The modem is connected at a data rate lower than the line rate it is configured for. OFF – The modem is connected at its configured line rate.

The SDCP LEDs are listed and described in Table 4-2.

Table 4-2
SDCP LEDs

Label	Color	Indicates
OK	green	Power is ON and the modem is capable of operating.
Alarm	red	The modem has detected a problem with its operation. For example, the modem failed a self-test.
BckUp	yellow	The modem, originally configured for leased-line operation, is now operating on dial networks in a Dial Backup mode.
Test	yellow	The modem is involved in a test. Normal operation is not possible.
EC	green	Modem is in Error Control mode.

DCP Operation

The 3800*Plus* modem's diagnostic control panel (DCP) is the user interface to all functions used to configure and control the modem. This interface includes the status light-emitting diodes (LEDs), and a 2-line, 32-character liquid crystal display (LCD) and keypad (Figure 4-3).

Use the DCP to display the following kinds of information:

- Operational status
- Configuration options
- DCP entry displays
- Remote modem access

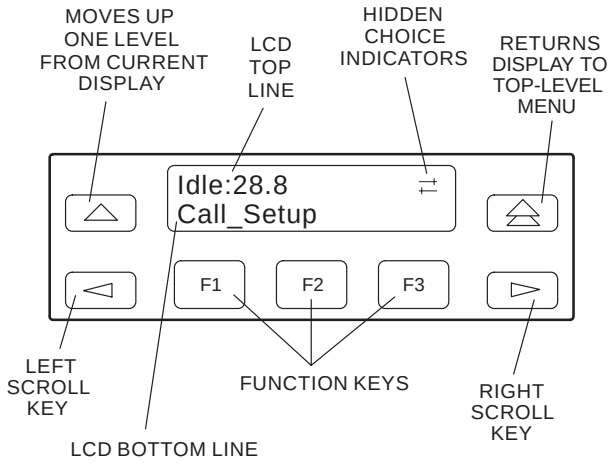


Figure 4-3. 3800*Plus* LCD and Keypad

LCD Display

The LCD consists of a top line and bottom line, with each displaying a maximum of 16 characters at a time. If additional information appears on the LCD than what is currently displayed, a hidden choice indicator (< or ⇄ or >) appears in the upper right-hand corner of the LCD. Use the ◅ or ▻ key to scroll in the indicated direction to display more selections onto the LCD.

Hidden Choice Indicators

The Hidden Choice Indicators serve as an alert that other selections are available besides what is currently displayed on the LCD. These indicators appear as one of the following symbols:

Right Scroll Indicator >

The right scroll indicator displays when more choices are available to the right of what is currently displayed on the LCD.

Left/Right Scroll Indicator ⇄

The left/right scroll indicator displays when more choices are available to the left and right of what is currently displayed on the LCD.

Left Scroll Indicator <

The left scroll indicator displays when more choices are available to the left of what is currently displayed on the LCD. The LCD does not wrap around to the first choice once you have reached the end of choices.

Remote Mode Indicator r

If the local 3800*Plus* modem establishes a connection with the remote 3800*Plus* modem via the Remote branch, then r appears in place of the hidden choice indicator on both modems.

Keypad

The DCP on the 3810*Plus* modem has seven keys while the optional SDCP of the COMSPHERE 3000 Series Carrier has eight keys. The additional key on the carrier is the Select key, used to connect the SDCP to a specific slot in the carrier.

⏢ *Key*

The ⏢ key returns you to the Top-Level menu display from anywhere in the menu tree.

Pressing ⏢ while changing configuration options displays the message **Save Straps? Yes No**. If **No** is selected, changes made to configuration options are not saved and the Top-Level menu appears. If **Yes** is selected, then changes are saved to either Active (Saved), Customer 1, or Customer 2 configuration areas.

△ *Key*

The △ key moves you up one level in the menu tree.

◁ *and* ▷ *Keys*

Use the ◁ and ▷ keys to move the viewing window left or right and to scroll the remaining branches and selections into view. A maximum of three selections can be displayed at one time.

These keys also allow you to move the cursor one character to the left or right on data entry displays; for example, to allow entry of one digit at a time.

F1, F2, F3 Keys

Function keys select the LCD choice that appears above the function key; they are labeled F1, F2, and F3. If a selection spans more than one function key, then any of those keys choose that selection.

Up and Down Scroll Indicators ↑ ↓

To enter a number on the DCP, such as a telephone number to be stored in the modem's directory, the function keys F2 (↑) or F3 (↓) are used. A displayed number is increased or decreased according to whether the key associated with the up arrow or the down arrow is pressed. In other applications, such as password entry, only the up arrow is displayed, and the displayed numbers can only be incremented.

Select *Key (3811Plus only)*

The Select key appears on the optional SDCP of the COMSPHERE 3000 Series Carrier. It is used to connect the SDCP to a modem in a specific slot in the carrier.

Menu Structure

The menu tree is a hierarchical structure used to display functions that configure and control local and remote 3800*Plus* modems. It is accessed via the DCP and is shown in Appendix A, *Menu Tree*.

The menu tree contains the following branches:

Call Setup — Used to dial, disconnect, and answer telephone calls as well as store up to 10 telephone numbers in directory locations. (See Chapter 5.)

Status — Used to monitor the current status of the VF line and DTE interface as well as view the identity of the modem. (See Chapter 6.)

Test — Used to begin and end various modem tests. (See Chapter 7.)

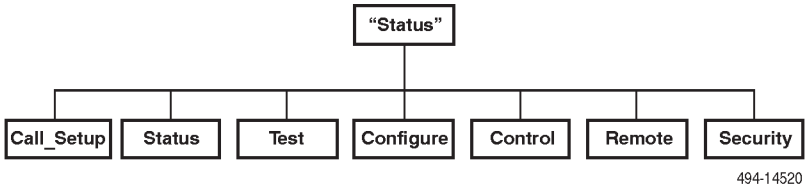
Configure — Used to change and save the modem's configuration options. (See Chapter 8.)

Control — Used to control the modem's hardware and software functions. (See Chapter 9.)

Remote — Used to access and control a remote 3800*Plus* modem. (See Chapter 10.)

Security — Used to control the modem's dial access security. Appears only if the optional security feature is installed. (See Chapter 11.)

Menu tree branches are described in Chapters 5 through 11. Functions that appear on the LCD vary depending upon the type of model installed, its operating mode, and software configuration.



Top-Level Menu Status and Operational Messages

Access to all menu tree branches from the DCP begins at the Top-Level menu, the head of the menu hierarchy. The LCD's top line identifies the modem status, as listed in Table 4-3, while the bottom line displays the main menu tree branches and operational and dial access security messages, as listed in Table 4-4 and Table 4-5.

Messages listed in Table 4-4 are common operational messages that occur during modem operation. These messages normally appear on the second line of the LCD.

Messages listed in Table 4-5 are dial access security messages that can occur when the optional security feature is installed.

The Top-Level menu's main branches appear on the LCD in the order of Call Setup, Status, Test, Configure, Control, Security, and Remote. These branches are described in the following chapters.

Table 4-3
(1 of 3)
Top Level Menu Status

Normal Operation Status Message	Indicates
Idle:*MR**	The modem is configured for dial network operation and is on-hook.
Leased:*MR**	The modem is operating on leased lines at the displayed data rate.
OnLine:*MR* EC***	Indicates the modem is online, in Data mode, and operating at the displayed data rate. EC (error control) displays if error control is operational.
Fax Tx:*MR**	The modem is transmitting a fax on a dial line.
Fax Rx:*MR**	The modem is receiving a fax on a dial line.
Ring Indicate	The local modem is receiving an incoming ring.
Test:*MR**	The modem is in test mode operating at the displayed data rate.
Alarm Status Message* **	**Indicates**
Make Busy	Indicates the modem is in a Make Busy condition.
Power On Fail	Indicates the modem has failed its Power-On Self-test.
Self Health Fail	Indicates a failure in the modem's hardware components.

*MR – Modem Rate indicates the data rate the modem is using. One of the following values appears: 300, 1200, 2400, 4800, 7200, 9600, 12K (12,000), 14.4K (14,400), 16.8K (16,800), 19.2K (19,200), 21,600, 24,000, 26,400, 28,800, 31,200, or 33,600 bps.

**EC – Error Control indicates the modem is online and using V.42 or MNP error control. One of the following values appears after the modem rates listed above: MNP2, MNP3, MNP4, MNP5, V42, V42b, or NoEC. (NoEC indicates the modem is connected in Buffer mode rather than error control. If an EC value does not appear, then the modem is in Direct mode.)

*** The Alarm Status Messages only appear when the Normal Operation Status Messages display; the LCD alternates between the two message sets.

Table 4-3
(2 of 3)
Top Level Menu Status

Normal Call Setup Messages	Indicates
Off Hook	The modem is off-hook and waiting to dial a telephone number.
Dialing	The remote modem is being dialed.
Training	The modem is training or retraining.
EC Negotiating	The local and remote modems are negotiating the highest possible level of error control compatible between both modems. Once a level is selected, this LCD message disappears.
Call Failure Messages	**Indicates**
Busy Signal	The answering modem is busy.
Dial Line in Use	The modem is already operating on dial networks when another call attempt has been issued.
Invalid Number	The modem has dialed a telephone number not stored in a directory location.
No Answer Tone	The answering modem has not answered within the time limit specified by the No Answer Timeout configuration option.
No Dial – DTR	The modem cannot dial because DTR is Off.
No Dial – Test	The modem cannot dial because it is running a Test.
No Dial Tone	The modem has aborted the call because it cannot detect a dial tone.
No Quiet Answer	The modem has detected No Quiet Answer (@) before the time-out setting of the No Answer Disconnect configuration option.
Trunk Busy	The modem is receiving a fast (trunk) busy.
Call Disconnect Messages	**Indicates**
ATH Disconnect	The modem has disconnected due to an ATH command.
Bad Lines Disc	The modem has disconnected because the lines do not support the modulation and/or data rate selected.
No Carrier Disc	The modem disconnects due to the loss of carrier signal from the remote modem.
DTR Disconnect	The modem has disconnected due to the loss of DTR from the DTE.
EC Disconnect	The modem has disconnected due to failure to negotiate Error Control mode.
LongSpace Disc	The modem has disconnected due to the detection of a long space.
NoData Disc	The modem has disconnected due to a lack of transmitted and received data.
Disconnecting	The modem has begun the disconnect sequence.
Rmt Cmnded Disc	The modem has disconnected due to a V.32 or V.34 Cleardown received from the remote modem.

Table 4-3
(3 of 3)
Top Level Menu Status

Dial Backup Messages	Indicates
Dial Standby	The modem is operating in Dial Standby mode.
DialBckUp:*MR**	The modem is operating in a Dial Backup mode at the displayed data rate and is configured for Direct mode.
Backup:*MR* EC***	The modem is operating in Dial Backup mode and is configured for error control and data compression on leased lines.
Stndby:*MR* EC***	The modem is operating in Dial Standby mode and is configured for error control and data compression on leased lines.
Firmware Download Result Messages	**Indicates**
DownldOnly Mode	Indicates that a local download of firmware or a remote cloning of firmware has failed. The modem is currently in a Download Only mode in which only another download attempt is possible.
Frmware Upgrade	Indicates that a local download of firmware or a remote cloning of firmware was successful.
RemClone Failed	Displays on the local modem's LCD and indicates that a remote cloning of firmware has failed.
Remote Clone OK	Displays on the local modem's LCD and indicates that a remote cloning of firmware was successful.
AT Command Reset Message	**Indicates**
Reset by AT command	The modem has performed a reset in response to an ATZ command.

* MR. Modem Rate indicates the data rate the modem is using. One of the following values appears: 300, 1200, 2400, 4800, 7200, 9600, 12K (12,000), 14.4K (14,400), 16.8K (16,800), 19.2K (19,200), 21,600, 24,000, 26,400, 28,800, 31,200, or 33,600 bps.

** EC. Error Control indicates the modem is online and using V.42 or MNP error control. One of the following values appears after the modem rates listed above: MNP2, MNP3, MNP4, MNP5, V42, V42b, or NoEC. (NoEC indicates the modem is connected in Buffer mode rather than error control. If an EC value does not appear, then the modem is in Direct mode.)

Table 4-4
Common Operational Messages

Common Operational Messages	Indicates
Please Wait...	Appears when a command to a local device takes more than two seconds to complete.
Command Sent...	Appears when a command is sent to a remote modem.
No Rem Response or Remote Modem Fail	Appears when a remote modem does not respond to a command within 5 seconds.
Command Complete	Appears when a command, issued to a local or remote modem, is completed.
Invalid Command	Appears when the modem cannot complete a command.

Table 4-5
Dial Access Security Messages

Dial Access Security Messages	Indicates
Get VF PsWd	The answering modem is waiting for the originating caller to transmit a VF password.
Get DTE PsWd	The answering modem is waiting to receive a valid DTE password from the remote DTE.
VF PsWd Timeout	The modem did not finish answering a call (disconnected) because the allowed time limit was exceeded before the modem received a VF password from the originating dialer.
Unknown DTEpswd	The modem did not finish answering a call (disconnected) because the DTE passwords received from the remote DTE were invalid.
No Orig PsWd	The modem did not attempt to establish a call as requested because the AT dial command did not contain an originate access password.
Unknown VF PsWd	The modem did not finish answering a call (disconnected) because the modem received an invalid VF password.
DTEpswd Timeout	The modem did not finish answering a call (disconnected) because the allowed time limit was exceeded before the modem received a DTE password from the remote DTE.
Inval Orig PsWd	The modem did not attempt to establish the call as requested because the originate password in the AT dial command was not valid.
DTR Dial Blocked	Appears if DTR dialing is used and Answer Access or Originate Access security is enabled. DTR dialing is not permitted when security is enabled.
SecurityBlocked	Appears only when the modem is in base mode (a mode that occurs during a firmware download) and Answer Access Security is enabled. In this case, the access verification capabilities are not available and the modem does not pass data to the DTE under any circumstances.

Selecting Factory Configuration Options

After the modem passes the power-up self-test, configure it for operation using one of the factory preset configurations.

The 3800*Plus* modems have several factory preset templates that contain the most commonly used configuration options (straps) for Asynchronous Dial, Synchronous Dial, Synchronous Leased (Answer or Originate), UNIX hardware network, cellular mobile, and cellular PSTN configurations. Your modem is shipped from the factory with the Async Dial default configuration options stored in memory. If Sync Dial, Sync Leased, UNIX Dial, or Cellular is more appropriate for your configuration, then you must change the factory setting using either the modem's DCP or the AT command set as described in the following sections.

The preset configuration gives you a "head start" in getting your modem operating and reduces the amount of time required to configure your modem. For a better understanding of DCP operation and factory preset configuration options, refer to Chapter 8, *Configure Branch*.

Using the Diagnostic Control Panel (DCP)

The DCP's liquid crystal display (LCD) consists of two 16-character lines which display modem status, control functions, and configuration options as well as indicating your location in the Top-Level menu tree (Appendix A).

To change the factory template using the DCP, perform the following steps:

1. On the DCP press the ▻ key until **Configure** comes into view.

2. Press the function key below Configure to select the Configure branch.

   The LCD now displays **Ld EditArea frm.**

3. Press the ▻ key until **Factory** comes into view, then press the F1 key to display the factory preset configurations.

   Factory preset configurations are **Async Dial, Sync Dial, Sync Leased**, **UNIX Dial**, **Cellular (Mobile)**, and **Cellular (PSTN)**. If Sync Leased is selected, you must choose either **Answer** or **Originate** mode.

4. Press the ▻ key until the appropriate factory preset appears on the LCD, and press the corresponding function key to select your choice.

5. **Choose Function** appears and displays the Edit and Save functions.

6. Press the F3 key (Save) to save the new factory preset configuration to one of three configuration areas, **Active (Saved), Customer 1**, or **Customer 2**.

   (These three configuration areas are nonvolatile memory locations. Active (Saved) contains the most recently saved changes to any configuration options. In the event of power loss, the modem retrieves these configuration options. Customer 1 and Customer 2 are user-defined configuration areas.)

   The LCD now displays **Sav EditArea to**.

7. Press the ▻ key until the appropriate configuration area appears on the LCD, then press the corresponding function key to select your choice. (Saving configuration options to the Active (Saved) configuration area automatically saves them to the Active (Operating) configuration area.) The LCD displays **Command Complete**.

8. The modem is now configured with the selected factory template. Press the ⏢ key to return to the Top-Level menu.

Refer to Chapter 8, *Configure Branch*, for more information regarding default factory configuration options.

Using AT Commands

When using AT commands, the following criteria must be met:

- Make sure the asynchronous DTE's communication software is configured for 10-bit character format (for example, 8 data bits, no parity, and 1 stop bit).
- Make sure the DTE (RS-232D) cable is attached to the DTE connector on the rear of the 3810*Plus* modem, or (for the 3811*Plus* modem) the rear of the COMSPHERE 3000 Series Carrier, and the correct serial communications port on the asynchronous DTE.

- On initial power-up, the modem is in Command mode. To verify that the modem is connected and functioning properly, enter the following:

  TYPE: AT

  PRESS: Return (Enter)

  The screen displays **OK.**

If the modem does not return **OK**, refer to Appendix C, *Troubleshooting*.

NOTE

If you have already changed the factory preset configuration you may have lost AT command control. To regain AT command control, select, via the DCP, the Async Dial factory preset configuration as described earlier in *Using the Diagnostic Control Panel (DCP)*.

To change a factory template using AT commands, perform the following steps (for more information on changing factory templates using AT commands, refer to Chapter 13, *AT Command Set and S-Registers*).

1. Use the AT&F&W command to load the appropriate factory configuration to the appropriate storage area. Enter the following:

   TYPE: AT&F*y*&W*n*

   Where: *y* is one of the following Factory configurations:
   0 for Async Dial
   1 for Sync Dial
   2 for Sync Leased (Answer)
   3 for UNIX Dial
   4 for Sync Leased (Originate)
   5 for Cellular (Mobile)
   6 for Cellular (PSTN)

   (NOTE: &F1, &F2, and &F4 remove AT command control. The only way to return to AT command control is through the DCP as described earlier in *Using the Diagnostic Control Panel (DCP)*.)

   and

   Where: *n* is one of the following storage areas:
   0 for Active (Saved)
   1 for Customer 1
   2 for Customer 2

   (NOTE: These three configuration areas are nonvolatile memory locations. Active (Saved) contains the most recently saved changes to any configuration options. In the event of power loss, the modem retrieves these configuration options. Customer 1 and Customer 2 are user-defined configuration areas.)

   PRESS: Return (Enter)

2. The selected factory configuration is saved.

The &V (View) command can be used to display the configuration options in effect. The output of the &V command can be saved to a file and printed (using your communications software), providing both a record of your configuration and a worksheet for configuration enhancements. Refer to Chapter 13, *AT Commands and S-Registers*, for more on AT commands.

Diagnostic Control Panel Security Access

NOTE

This page of the manual is self-supporting and can be removed to prevent unwanted knowledge of the DCP security access selections.

Use the DCP security access function to ‘‘lock” the DCP of any 3800*Plus* modem and prevent unwanted user access. Two options are available for this function: Grant and Deny.

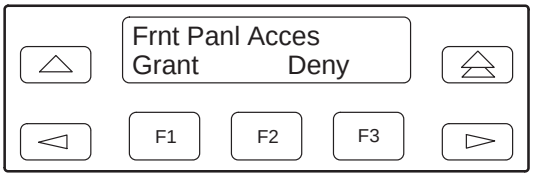
Grant allows any branch of the Top-Level menu to be accessed from the DCP. Deny allows access only to the Status branch of the Top-Level menu. All 3800*Plus* modems are shipped from the factory with DCP access granted.

To access the Front Panel (DCP) Security Access function, perform the following:

Press the △ key three times.

Press the ⏫ key twice.

Press the △ key once.



Select Grant to allow access or select Deny to lock DCP access.

Either selection results in a return to the Top-Level menu.

This page intentionally left blank.

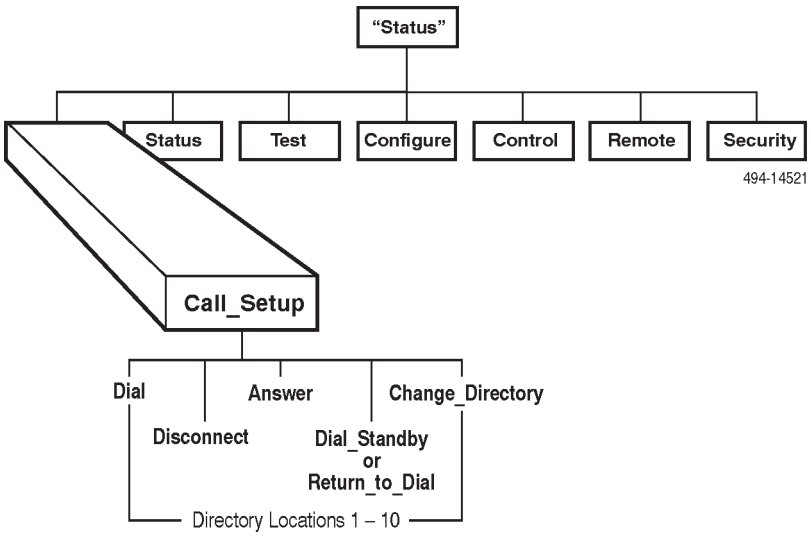
Call Setup Branch 5

Overview

The Call Setup branch of the Top-Level menu allows you to dial, disconnect, and answer telephone calls. It also allows you to create and store up to 10 telephone numbers to directory locations. Six different functions can appear under Call Setup: Dial, Disconnect, Answer, Dial Standby or Return to Dial (when applicable), and Change Directory.

NOTE

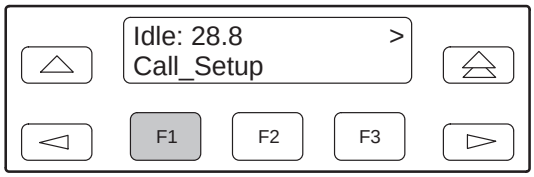
The Dial Standby and Return to Dial functions only appear when the modem is in Dial Backup mode.



Call Setup Branch

In the following descriptions, the shaded key indicates what key to press to perform the described operation.

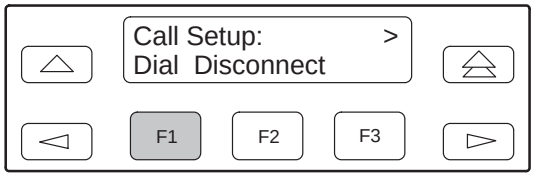
To access the Call Setup branch from the Top-Level menu, select Call Setup:



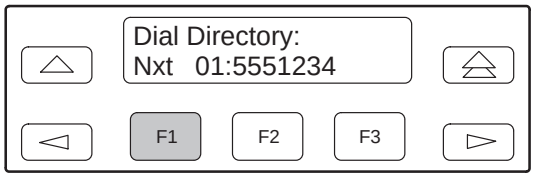
Dial

Dial allows you to dial any telephone number stored in directory locations 1–10. Any telephone number dialed using the DCP must already exist in a directory location. Refer to Change Directory for information on storing telephone numbers in directory locations.

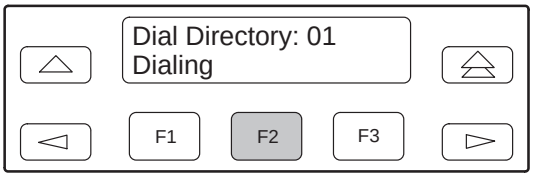
To access Dial from the Call Setup branch, make the following selection:



Select Dial to display the first directory telephone number.



To view other directory locations, select Nxt.



Once the directory location you want appears on the LCD, press the F2 or F3 key to dial the number.

If the connection is successful, the modem is online and one of the Normal Operation status messages appears on the LCD. If the connection is not successful, the LCD displays one of the Call Failure status messages. (See Table 3-3 in Chapter 3.)

If DTE dialing is enabled and any character is received from the DTE before the modem goes online, the dial sequence is aborted. This is known as any-key abort.

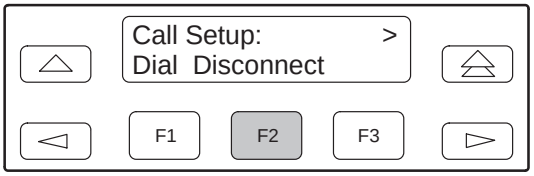
AT Command Equivalent

The AT command equivalent for Dial is DS=*n*, where n is directory location 1–10.

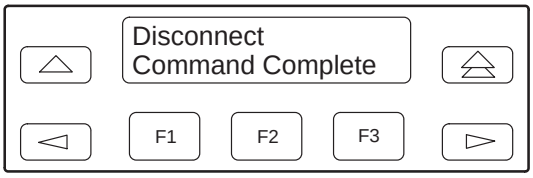
Disconnect

Disconnect allows the modem to go on-hook (hang up). Use this function when you want to disconnect an established call on a dial line.

To access Disconnect from the Call Setup branch, make the following selection:



Select Disconnect.



The modem goes on-hook (hangs up) and the call is disconnected. This includes any calls being used for dial backup of leased lines. The **Command Complete** status message is displayed.

To exit this function and remain in the Call Setup branch, press the △ key. To exit and return to the Top-Level menu, press the ⏫ key.

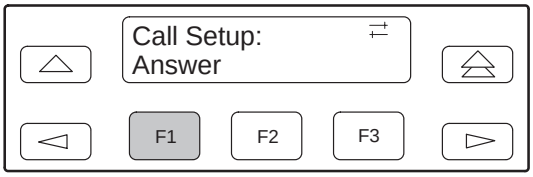
AT Command Equivalent

The AT command equivalent for Disconnect is H or H0.

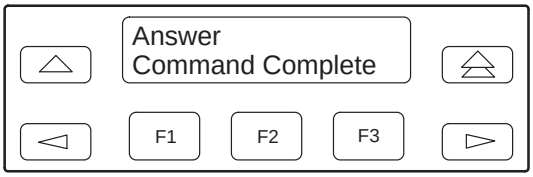
Answer

Answer allows the modem to go off-hook, generate an answer tone, and begin the handshaking process with the calling modem. Use the Answer function when the Auto-Answer Ring Count configuration option is disabled. (See the *Line Dialer* section in Chapter 8, *Configure Branch*.)

To access Answer from the Call Setup branch, make the following selections:



Press the ▷ key until Answer is displayed. Select Answer.



The modem goes off-hook and attempts to establish a connection in Answer mode. The **Command Complete** status message appears on the LCD.

To exit this function and remain in the Call Setup branch, press the △ key. To exit and return to the Top-Level menu, press the ⏫ key.

AT Command Equivalent

The AT command equivalent for Answer is A.

Dial Standby/Return to Dial

The Dial Standby and Return to Dial functions appear on the LCD only after the modem, operating on leased lines, is placed into dial backup. Once the modem is operating in Dial Backup mode, these functions allow the modem to be switched back and forth between dial and leased-line operation while still maintaining the dial connection. See Figure 5-1. (Switching between dial and leased-line operation can be performed manually or automatically by enabling the Auto Dial Standby configuration option.)

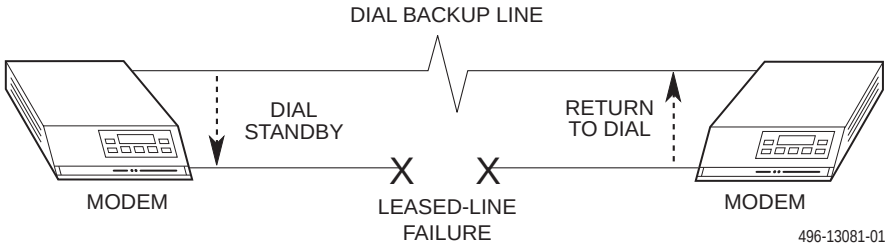
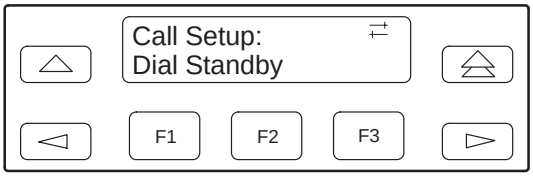
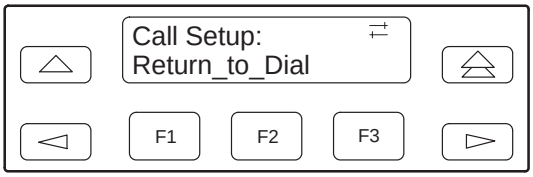


Figure 5-1. Dial Backup

For example, under normal dial backup conditions, when a problem occurs on the leased line, the modems establish a connection over the dial network using a telephone number stored in directory location 1.

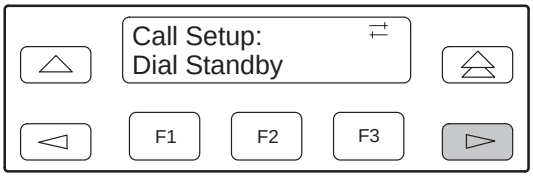


When this occurs, the Dial Standby function now appears on the LCD. By selecting this function, the modem switches back to the leased line while still maintaining the dial connection. As a result, the Return to Dial function now appears on the LCD instead of Dial Standby.

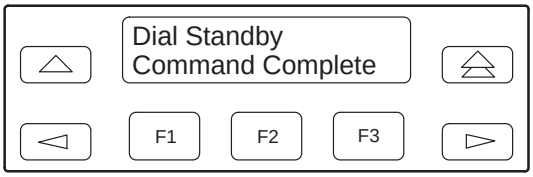


If the leased line is found to be unacceptable, select Return to Dial which switches the modem back to dial network operation (LCD displays Dial Standby). If, however, the leased line is operating properly, you can select Disconnect from the Call Setup branch and drop the dial-line call.

To access Dial Standby or Return to Dial from the Call Setup branch, make the following selections:



Press the ▷ key until Dial Standby or Return to Dial is displayed. Select the appropriate function.



If the modem is operating in a Dial Backup mode, the Dial Standby function forces the modem to leased lines and displays the status message **Command Complete**.

Once the modem is in Dial Standby mode, the Return to Dial function appears on the LCD. Selecting this function forces the modem to dial networks and displays the status message **Command Complete**.

AT Command Equivalent

There is no AT Command equivalent for Dial Standby or Return to Dial.

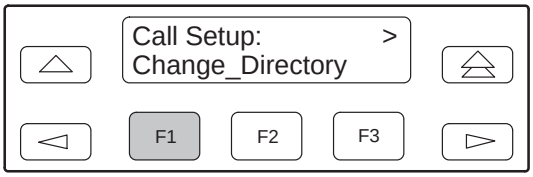
Change Directory

Change Directory allows you to enter or modify telephone numbers. The modem has nonvolatile memory locations that allow you to store up to 10 telephone numbers. Each directory location can accept up to 40 characters; this includes the telephone number and dial command modifiers. Any telephone number dialed using the DCP Dial command must appear in a directory location.

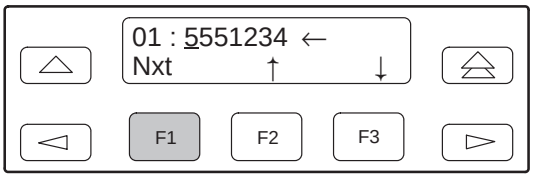
NOTE

If the modem is operating on leased lines and has a dial line attached for dial backup purposes, it is required that directory location 1 contain the telephone number used for dial backup.

To access Change Directory from the Call Setup branch, make the following selections:



Press the ▷ key until Change Directory is displayed. Press any function key to select Change Directory.

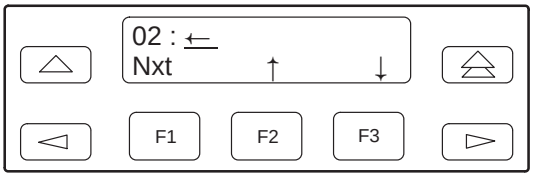


The phone number listed in directory location 1 is displayed. Select Nxt to display other directory locations.

Entering Telephone Numbers and Dial Command Modifiers into Directory Locations

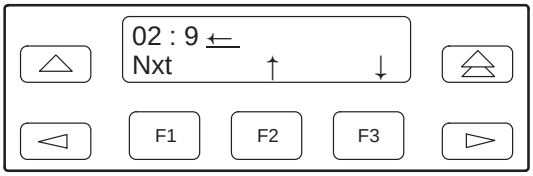
The following example uses an empty directory location for describing how to enter a telephone number. If you want to change an existing telephone number in any of the ten directory locations, follow the same procedures.

To add a telephone number to a directory location, make the following selections:



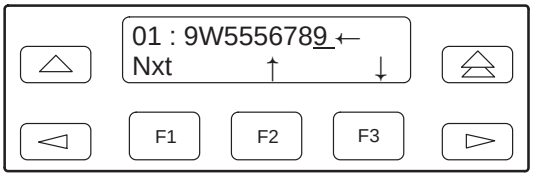
Select Nxt until a blank directory appears on the LCD. (The cursor (⇆) always appears in the first character position.)

Select F2 (↑) or F3 (↓) until the desired character is selected. This can be an alpha or numeric character.



Press the ▷ key to move the cursor to the next character position.

Continue this key sequence until the dial command modifiers and telephone number are entered. (Refer to Table 5-1 for an explanation of the dial command modifiers available from the DCP.)



To save the number just entered, scroll to the next directory location by selecting Nxt. The number is now stored in nonvolatile memory.

AT Command Equivalent

The AT command for Change Directory is & Z*n*=*x*, where *n* is the directory location and *x* is the telephone number.

Table 5-1 describes what can be entered in directory locations.

Table 5-1
Valid Dial Command Modifier

Dial Command modifiers are parameters entered in the dial command string which specify how, when, and what number to dial. The following is a list of parameters the 3800*Plus* modems recognize:
T – Tone (DTMF) dial. Any digit 0–9, *, #, A, B, C, or D can be dialed as tone. **P** – Pulse dial. Only the digits 0–9 can be dialed in Pulse Dial mode.
, – Pause. Causes the modem to pause before processing the next character in the dial string. The length of this pause is determined by the setting of the Pause Time configuration option (see Line Dialer configuration option group) or by value held in S-Register S8.
W or **+** – Wait for dial tone. Modem waits for a second dial tone before processing the dial string. This can be the initial dial tone or can be used when dialing through a tandem PBX. For example, 9W 555-6789.
R – Reverse Dial mode. Causes the originating modem to send out an answertone once it no longer detects ringback. (Ringback is the ring you hear at the originating site when making a call.) The R parameter must be the last character in the dial string.
@ – Quiet answer. Wait for five seconds of silence after dialing the number. If the silence is not detected, the modem sends the NO ANSWER result code to the DTE or displays the No Quiet Answer LCD status message.
! – Hook flash. This causes the modem to go on-hook for 0.5 seconds then return to off-hook.
; – Return to Command mode. Modem returns to Command mode after dialing a number without disconnecting the call. This permits you to enter long international telephone numbers, or additional information such as a calling card number, that would exceed the 40-character limit.
Space, **–**, and **( )**. These characters are ignored by the dial string and can be included to enhance readability.
←– End of Number. Hides all characters appearing on the LCD entered to the right of this indicator.

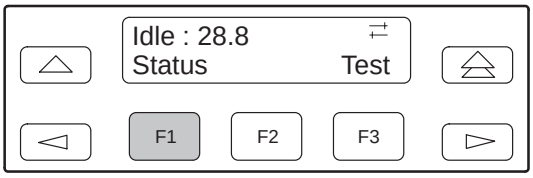
Status Branch 6

Overview

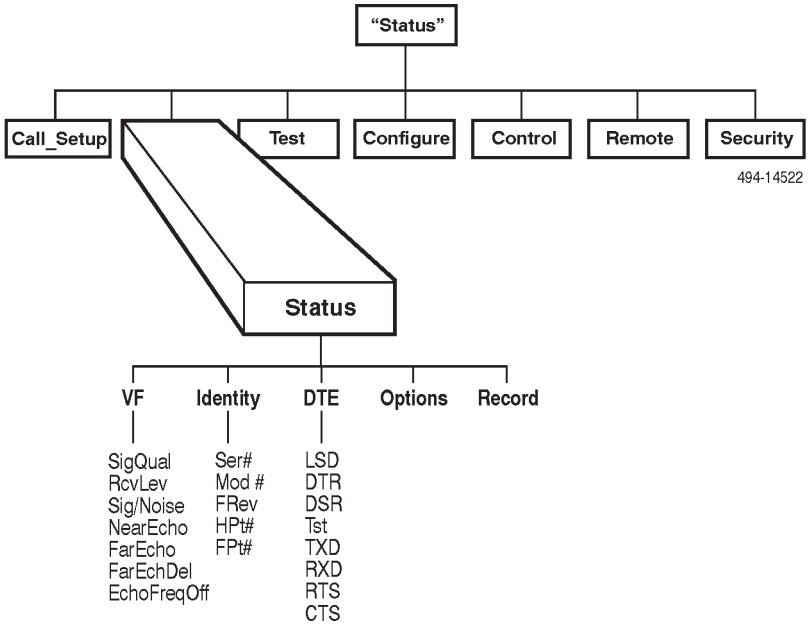
The Status branch of the Top-Level menu allows you to view the current status of the dial or leased-line connection, the DTE interface, and the identity (for example, serial number and model number) of your equipment. There are up to five selections under Status: VF, Identity, DTE, Options, and Record.

Status Branch

To access Status from the Top-Level menu, make the following selections:



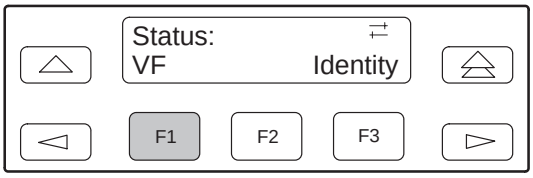
Press the ▻ key until Status appears. Select Status.



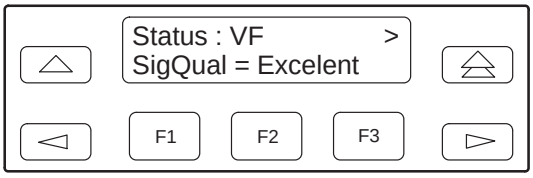
VF

VF displays the condition of the dial or leased-line connection.

To access VF from the Status branch, make the following selection:



Select VF.



The modem's signal quality is displayed on the LCD's bottom line. Press the ▷ key to scroll and view the receive signal level, signal-to-noise ratio, near end echo, far end echo delay, and echo frequency offset.

> **NOTE**
>
> SigQual, NearEcho, FarEcho, FarEchDel, and EchoFreqOff values appear only for V.34, V.32*terbo*, V.32bis, and V.32 modulations.

SigQual — Signal Quality indicates the condition of the VF line. Possible values are *Excelent* (Excellent), *Good*, *Fair*, *Poor*, or *No Signal*.

RevLev — Receive Signal Level indicates, in decibels referenced to one milliwatt (dBm), the actual strength of the incoming signal.

Sig/Noise — Signal-to-Noise Ratio indicates, in decibels, the receive signal strength relative to noise on the line.

NearEcho — Near End Echo displays the signal level, in decibels referenced to one milliwatt (dBm), of that portion of the transmit signal which has been echoed back by the local line termination.

FarEcho — Far End Echo displays the signal level, in decibels referenced to one milliwatt (dBm), of that portion of the transmit signal which has been echoed back by the remote line termination.

FarEchDel — Far End Echo Delay indicates the roundtrip delay in milliseconds of the far end echo.

EchoFreqOff — Echo Frequency Offset indicates the frequency offset of the far end echo.

To exit VF and remain in the Status Branch, press the △ key. To exit and return to the Top-Level menu, press the ⏫ key.

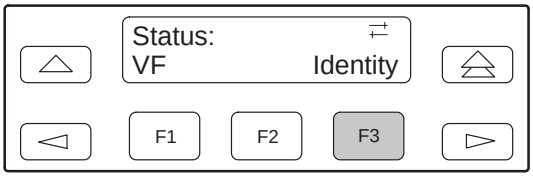
AT Command Equivalent

There is no AT command equivalent for VF status.

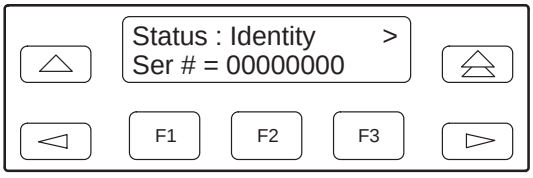
Identity

Identity displays the modem's serial number, model number, firmware revision level, hardware part number and firmware part number. Retrieval of this information is useful if you are purchasing additional or replacement modems and/or making firmware upgrades.

To access Identity from the Status branch, make the following selection:



Select Identity.



The modem's serial number is displayed on the LCD's bottom line. Press the ▷ key to scroll and view the model number, firmware revision level, hardware part number, and firmware part number.

Ser # Serial number is an 8-digit number that identifies the modem.

Mod # Model number is an alphanumeric number that identifies the modem as either a 3810Plus modem (if the model number begins with 3980) or a 3811*Plus* modem (if the model number begins with 3981).

FRev Firmware revision level is an alphanumeric number that identifies the level of firmware loaded in the modem.

HPt # Hardware part number is an 11-digit number that identifies the circuit card in the modem.

FPt # Firmware part number is an 11-digit number that identifies to service personnel the firmware release number.

To exit this function and remain in the Status branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

AT Command Equivalent

The AT command I0 displays the product code, normally 144.

The AT command I1 displays an abbreviated firmware revision number.

The AT command I2 performs an EPROM check and displays **OK** or **Error**.

The AT command I3 displays the modem's serial number.

The AT command I4 displays the modem's model number.

The AT command I5 displays the part number of the circuit card.

The AT command I6 displays the firmware release number.

The AT command I9 displays the firmware revision number (same as I1).

The AT command I10 alters the value of the product code displayed with the I0 command. See Chapter 13 for more information about the I0 command.

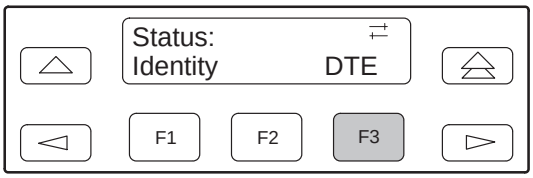
The AT command I11 performs a checksum of the modem's firmware and displays the results in hexadecimal. (There is no DCP equivalent of this command.)

The AT command I19 displays the firmware revision level.

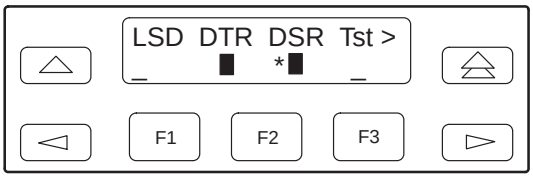
DTE

DTE displays the state and/or activity of the EIA-232-D interface leads: LSD, DTR, DSR, Tst, TXD, RXD, RTS, and CTS signals are monitored. The interface leads status is updated every 5 seconds.

To access DTE from the Status branch, make the following selections:



Press the key until DTE appears. Select DTE.



The activity and state of the modem's DTE signal appear on the LCD's bottom line. Press the ▻ key to scroll other signals into view.

The LCD's bottom line displays a pair of symbols for each interface lead. The first symbol indicates the signal's activity during the sampling interval. (An * (asterisk) indicates at least one transition while a blank space indicates no transitions since the last update.)

The second symbol indicates the state of the interface lead at the sampling time. (A ▮ block) indicates a Space or ON condition while an underscore (_) indicates a Mark or Off condition.)

To exit this function and remain in the Status branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

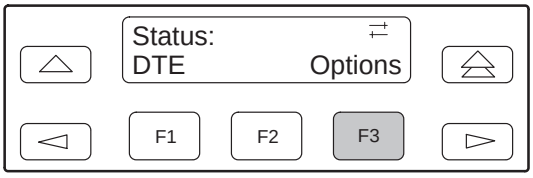
AT Command Equivalent

There is no AT command for DTE status.

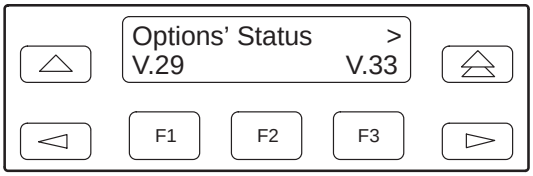
Options

The Options Status function displays all optional firmware features currently installed in the modem (for example, V.29, V.33, and dial network management). If no firmware options are installed, **None_Installed** appears on the LCD.

To access Options from the Status branch, make the following sections:



Press the ▻ key until Options appears. Select Options.



If optional features are installed in the modem, they appear on the LCD's bottom line. If other features are installed, press the ▻ key to scroll other features into view. If no optional features are installed, None_Installed is displayed.

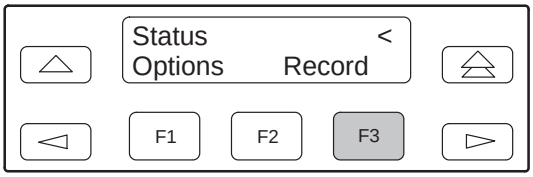
Record

Record is a troubleshooting tool used by the end user in conjunction with support personnel. This function allows the end user to retrieve and report any sequence faults to support personnel. A sequence fault is an irregular or unexpected event.

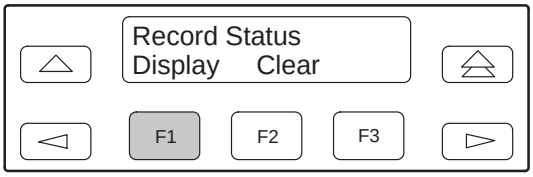
There are two selections under Record: Display and Clear. Display allows up to eight sequence fault messages that have been recorded by the modem to be displayed on the LCD. If no sequence faults have occurred, then **Modem O.K.** appears.

Clear is used to remove all sequence fault messages from nonvolatile memory and the LCD.

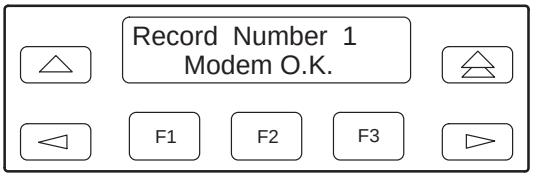
To access Record from the Status branch, make the following selections:



Press the ▻ key until Record appears. Select Record.



To display sequence faults, select Display.



The LCD displays the first sequence fault field. (Sequence fault fields range from 1 to 8 and are identified by a number in the upper right corner.) Press the ▻ key to view the remaining fields. The message **Modem O.K.** appears if no sequence faults have occurred.

To remove sequence fault records from both the LCD and nonvolatile memory, select Clear. The message **Modem O.K.** appears.

To exit this function and remain in the Status branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

AT Command Equivalent

There is no AT command for Record.

This page intentionally left blank.

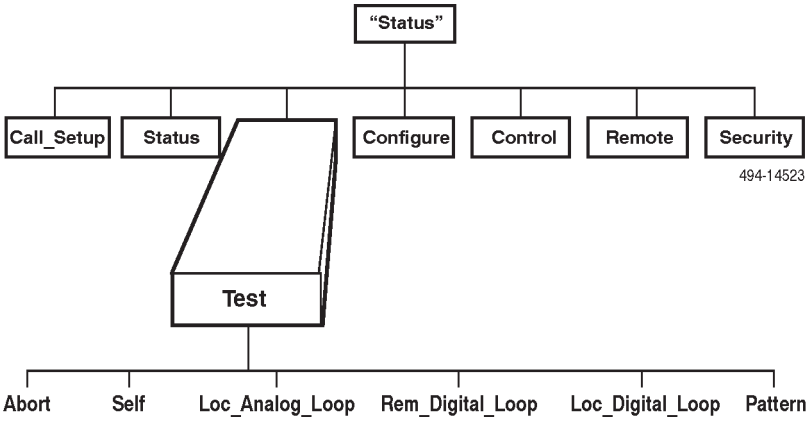
Test Branch 7

Overview

The Test branch of the Top-Level menu allows you to initiate various modem tests. Use these tests if you are having data communication problems, such as periodic character loss, random errors, or constant format errors. By the process of elimination, you can usually isolate the fault in your system.

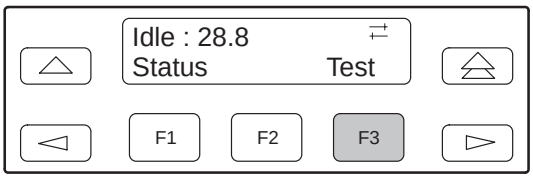
There are six selections under Test: Abort, Self (Self-Test), Loc Analog Loop (Local Analog Loopback), Rem Digital Loop (Remote Digital Loopback), Loc Digital Loop (Local Digital Loopback), and Pattern. The only tests that can operate concurrently are Pattern with a Local Analog Loopback and Pattern with a Remote Digital Loopback. If any test is operating, besides the two combinations just mentioned, it must be canceled before starting another test.

The Test branch only initiates and cancels tests. If any parameters need to be set, refer to the *Test* section in Chapter 8, *Configure Branch*.



Test Branch

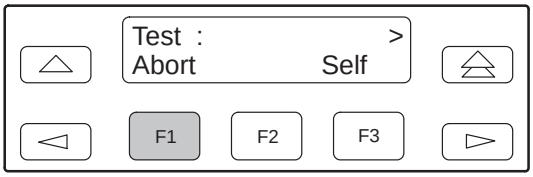
To access the Test branch from the Top-Level menu, make the following selections:



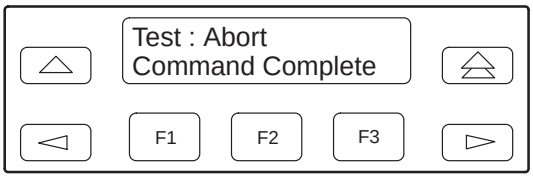
Press the ▻ key until Test appears. Select Test.

Abort

Abort ends any test that is in progress and brings the modem back to the normal mode of operation. Confirmation is provided by the **Command Complete** message.



Select Abort.



The modem stops all tests currently in progress and displays the **Command Complete** status message on the LCD. To exit this function and remain in the Test branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

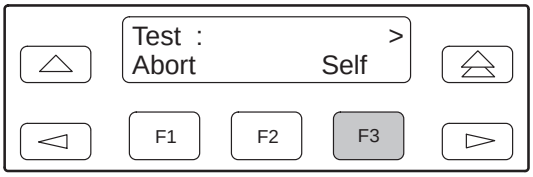
AT Command Equivalent

The AT command is &T0.

Self

Self performs an internal self-test of the modem, which takes less than a minute to complete. The modem must be offline (not connected with another modem), otherwise Invalid Command appears. This test is not valid in Remote mode and does not appear on the LCD of either modem when in Remote mode.

To access Self from the Test branch, make the following selection:



Select Self. (All LCD cells and DCP status indicators light.)

If the modem passes self-test, Pass appears on the LCD. If it fails, **Failed** appears. If the modem fails, contact your service representative.

If **Invalid Command** appears on the LCD, then another test is in progress or the modem is operating on dial lines. Select Abort to clear the current test, or disconnect to clear the dial lines, and then choose Self.

If the modem receives a ring signal during this test, the test is cancelled and the **RI Abort** message appears.

To exit this function and remain in the Test branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

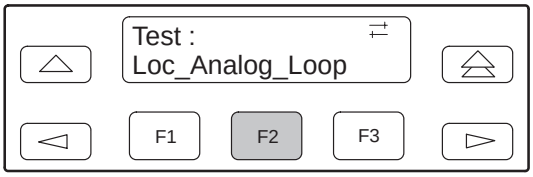
AT Command Equivalent

The AT command is &T9.

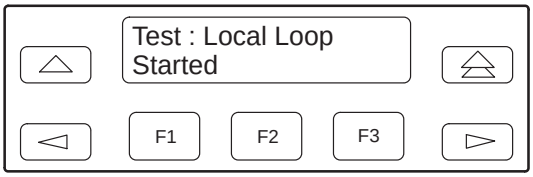
Loc Analog Loop

Loc Analog Loop performs a local analog loopback (ITU-T V.54 Loop 3), Figure 7-1, that verifies modem operation as well as the connection between the DTE and modem. The modem must be offline and in synchronous or asynchronous Direct mode to perform this test, otherwise **Invalid Command** appears.

To access Loc Analog Loop from the Test branch, make the following selections:



Press the ▷ key until Loc Analog Loop appears. Press any function key to start this test.



The message **Started** appears on the LCD, and the Test LED lights for the duration of the test.

If the Test Timeout configuration option is enabled, **Test Timeout** appears at the conclusion of the test. If it is disabled, the test operates until aborted. For more information on the Test Timeout configuration option, refer to the *Test* section in Chapter 8, *Configure Branch*.

A Ring Indicate during this test can cause errors.

To exit this function and remain in the Test branch, press the △ key. To exit and return to the Top-Level menu, press the ⏫ key.

AT Command Equivalent

The AT command for Local Analog Loopback is &T1.

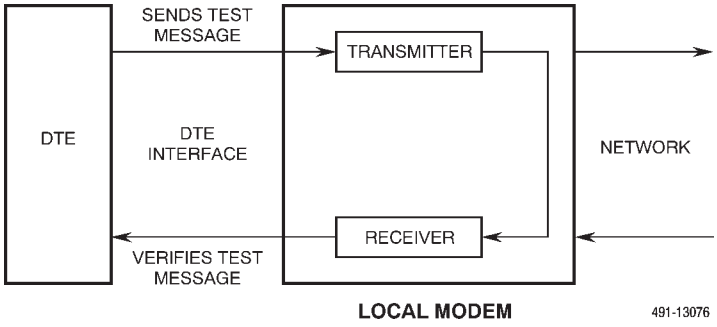
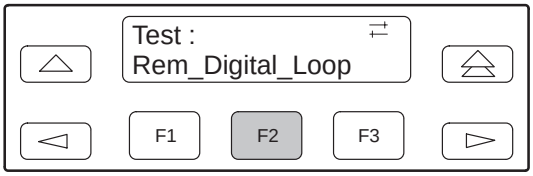


Figure 7-1. Local Analog Loopback

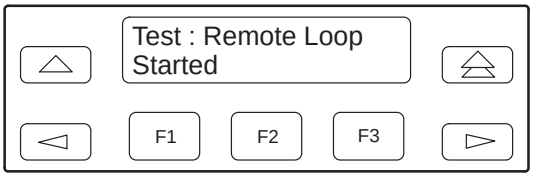
Rem Digital Loop

Rem Digital Loop performs a remote digital loopback (ITU-T V.54 Loop 2), Figure 7-2. This test can verify the integrity of the local modem, the communications link, and the remote modem. Any data or pattern entered at the local DTE is sent to and returned from the remote modem. For this test to operate properly, the modems must be online and in Synchronous or Asynchronous Direct mode and, if set for V.34 modulation, must not be in Asymmetric Rate mode.

To access Rem Digital Loop from the Test branch, make the following selections:



Press the ▻ key until Rem Digital Loop appears. Press any function key to start this test.



The message **Started** appears on the LCD, and the Test LED lights for the duration of the test.

If the Test Timeout configuration option is enabled, **Test Timeout** appears at the conclusion of the test. If it is disabled, the test operates until aborted. For more information on the Test Timeout configuration option, refer to the *Test* section in Chapter 8, *Configure Branch*.

To exit this function and remain in the Test branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

AT Command Equivalent

The AT command for Remote Loopback is &T6.

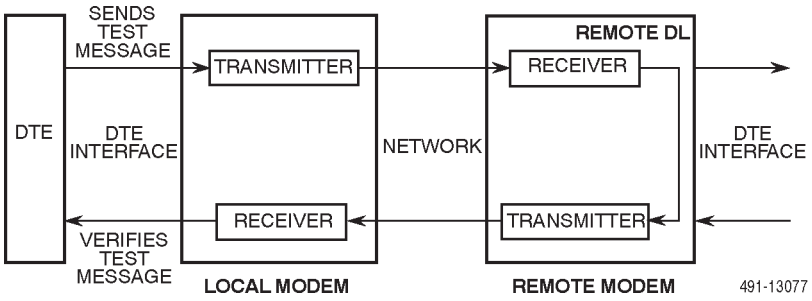
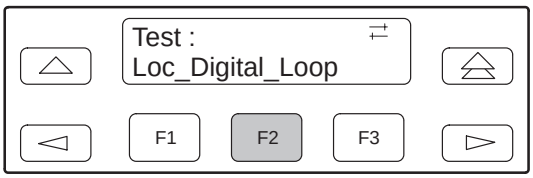


Figure 7-2. Remote Digital Loopback

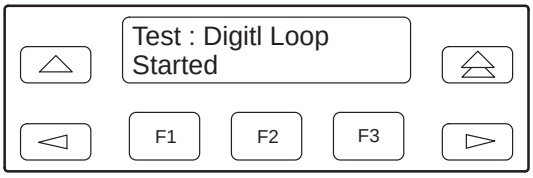
Loc Digital Loop

Loc Digital Loop is issued by a local modem and forces it to loopback any data received from the remote modem (Figure 7-3). (This test operates the same as an ITU-T V.54 Loop 2 except it is issued at your modem.) This is useful if a remote modem is incapable of initiating a remote digital loopback from its location. For this test to operate properly, the modems must be online and in Synchronous or Asynchronous Direct mode and, if set for V.34 modulation, must not be in Asymmetric Rate mode.

To access Loc Digital Loop from the Test branch, make the following selections:



Press the ▻ key until Loc Digital Loop appears. Press any function key to start this test.



The message **Started** appears on the LCD and the Test LED lights.

If the message **Invalid Command** appears on the LCD, then another test is in progress. Select Abort to clear the current test and then select Loc Digital Loop.

If the Test Timeout configuration option is enabled, Test Timeout appears at the conclusion of the LCD. If it is disabled, the test operates until aborted. For more information on the Test Timeout configuration option, refer to the *Test* section in Chapter 8, *Configure Branch*.

To exit this function and remain in the Test branch, press the △ key. To exit and return to the Top-Level menu, press the ⏏ key.

AT Command Equivalent

The AT command for Local Digital Loopback is &T3.

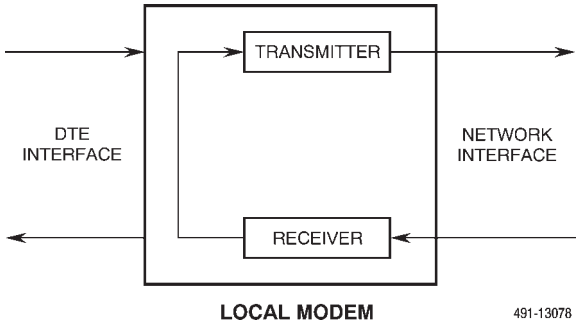


Figure 7-3. Local Digital Loopback

Pattern

Pattern can transmit and receive a 511 bit error rate test pattern. It can also be used with a local analog loopback or a remote digital loopback to simulate data passing through the modem. For this test to operate properly, the modems must be online and in Synchronous or Asynchronous Direct mode. Otherwise, the message **Invalid:Bffr Mde** appears when this test is started. (See Figures 7-4 through 7-6.)

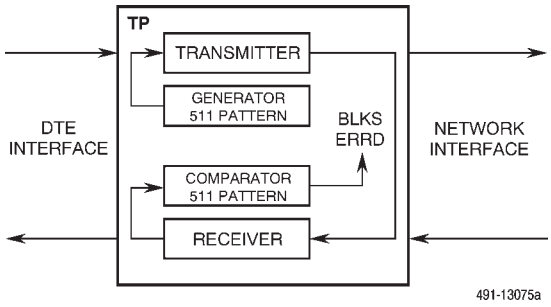


Figure 7-4. Pattern Test and Local Analog Loopback Test

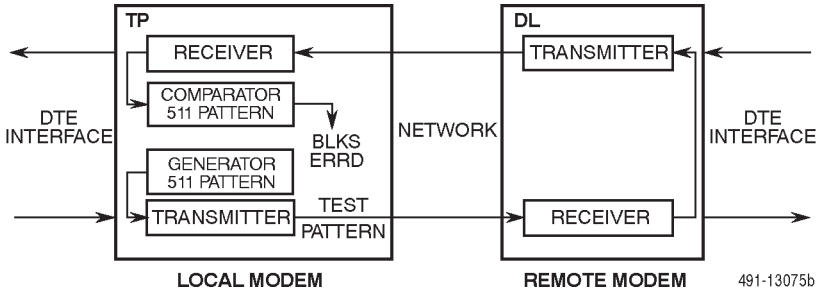


Figure 7-5. Pattern Test and Remote Digital Loopback Test

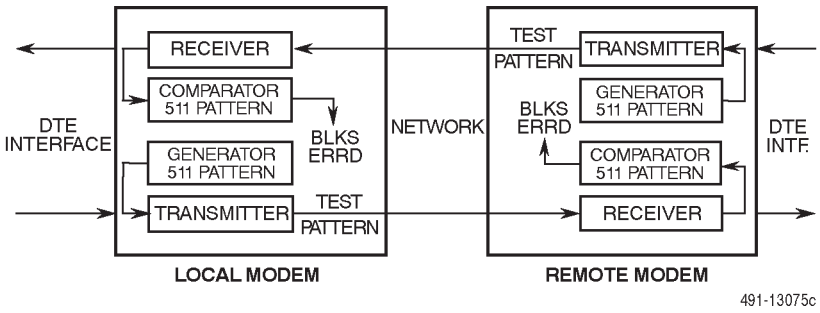
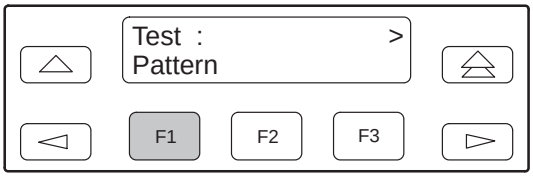
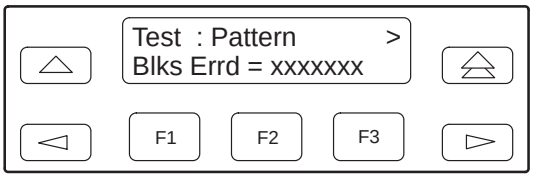


Figure 7-6. End-to-End Pattern Test

To access Pattern from the Test branch, make the following selections:



Press the ▻ key until Pattern appears. Select Pattern to start this test.



BlksErrd=xxxxxxx displays the number of blocks of data found in error (block size is 1000 bits per block). The message **NoSync** can appear as a value for BlksErrd while the modem's receiver is synchronizing. The message **OvrFlw** can appear as the value for BlksErrd if the counter overflows.

Press the ▻ key to display **BlksRcvd=xxxxxxx**, number of blocks of data received.

The Pattern test can be exited and reentered without restarting the test. The BlksErrd and BlksRcvd continue counting.

If the Test Timeout configuration option is enabled, **Test Timeout** appears at the conclusion of the test. If it is disabled, the test operates until aborted. For more information on the Test Timeout configuration option, refer to the *Test* section of Chapter 8, *Configure Branch*.

To exit this function and remain in the Test branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

AT Command Equivalent

The AT command for Pattern is &T2.

This page intentionally left blank.

Configure Branch 8

Overview

After installing a 3800*Plus* modem, you set its software configuration options using either the diagnostic control panel (DCP) or the AT command set. This chapter describes how to access and use the Configure branch of the Top-Level menu via the DCP.

The Configure branch accesses the Edit Area which is a work space where you view and change any configuration options (straps). These configuration options are loaded to the Edit Area from one of five configuration option areas: Active (Operating), Active (Saved), Customer 1, Customer 2, or Factory.

- **Active (Operating)** is a configuration area containing configuration options currently used by the modem. When the modem is powered on or when a save is performed, the contents of Active (Saved) are loaded into Active (Operating). Any changes made using AT commands directly affect this configuration area.
- **Active (Saved)** is a read from and write to configuration option area containing the most recently saved changes made to any configuration options. In the event of power loss or reset, the modem retrieves these settings from nonvolatile memory.
- **Customer 1** and **Customer 2** are two additional read and write (changeable) configuration areas where you can create and store additional configurations for specific applications.
- **Factory** is a read-only (unchangeable) configuration area containing sets of predefined configuration options for **Async Dial, Sync Dial, Sync Leased (Answer/Originate)**, **UNIX Dial**, and (if ETC is installed) **Cellular (Mobile)**, and **Cellular (PSTN)**. These sets contain the most commonly used configuration options for modems installed in these hardware environments, and give you a head start in configuring your modem. Factory default settings are listed in Appendix G, *Default Configuration Options*.

> **NOTE**
>
> If you are using AT commands, a period of time can exist in which the contents of Active (Operating) and Active (Saved) differ. Once you issue an AT&W0 (write) command, however, the two storage areas are identical.

Figures 8-1 and 8-2 graphically display the interaction between the edit area and configuration areas as viewed from the perspective of the DCP and the AT command set.

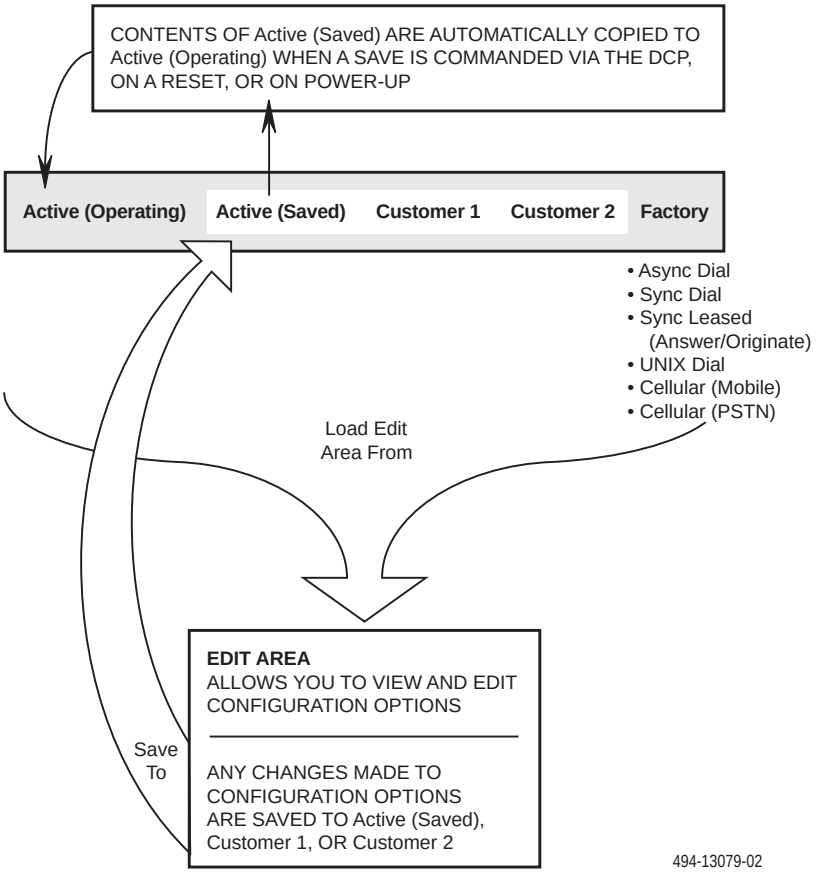

CONTENTS OF Active (Saved) ARE AUTOMATICALLY COPIED TO Active (Operating) WHEN A SAVE IS COMMANDED VIA THE DCP, ON A RESET, OR ON POWER-UP
Active (Operating)
Active (Saved)
Customer 1
Customer 2
Factory
• Async Dial
• Sync Dial
• Sync Leased (Answer/Originate)
• UNIX Dial
• Cellular (Mobile)
• Cellular (PSTN)
Load Edit Area From
EDIT AREA
ALLOWS YOU TO VIEW AND EDIT CONFIGURATION OPTIONS
Save To
ANY CHANGES MADE TO CONFIGURATION OPTIONS ARE SAVED TO Active (Saved), Customer 1, OR Customer 2
494-13079-02

Figure 8-1. DCP Configuration Process

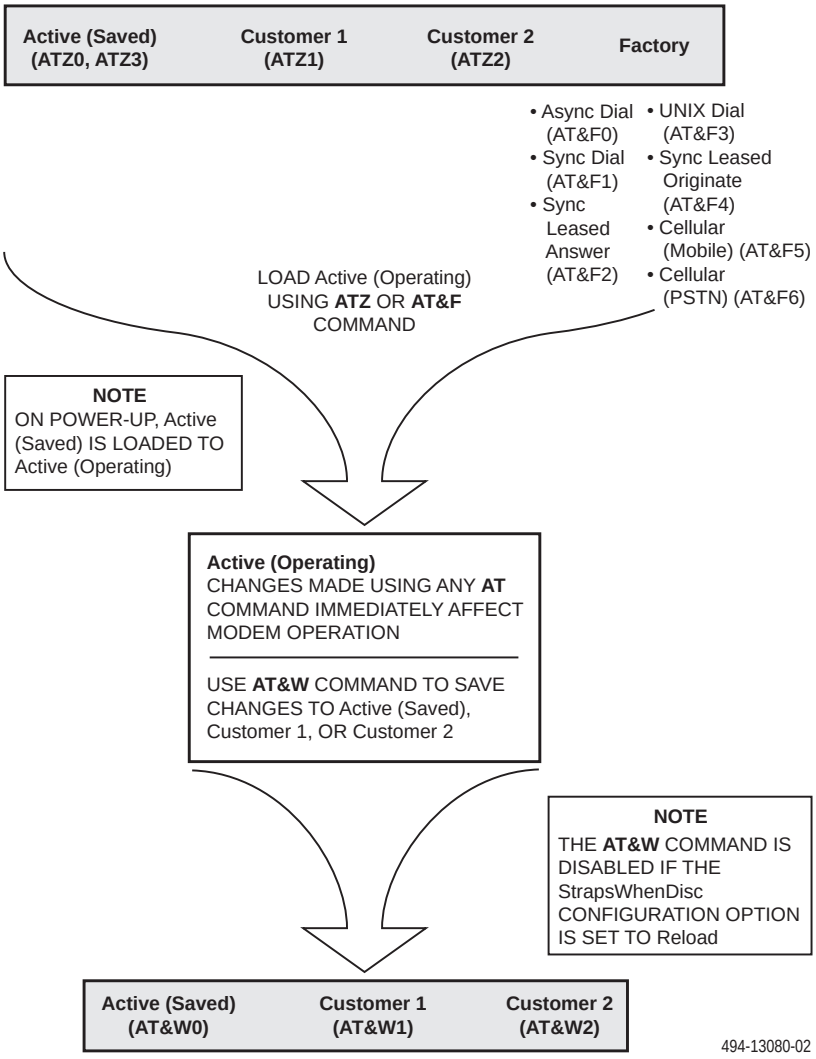

Active (Saved) (ATZ0, ATZ3)
Customer 1 (ATZ1)
Customer 2 (ATZ2)
Factory
• Async Dial (AT&F0)
• Sync Dial (AT&F1)
• Sync Leased Answer (AT&F2)
• UNIX Dial (AT&F3)
• Sync Leased Originate (AT&F4)
• Cellular (Mobile) (AT&F5)
• Cellular (PSTN) (AT&F6)
LOAD Active (Operating) USING ATZ OR AT&F COMMAND
NOTE
ON POWER-UP, Active (Saved) IS LOADED TO Active (Operating)
Active (Operating)
CHANGES MADE USING ANY AT COMMAND IMMEDIATELY AFFECT MODEM OPERATION
USE AT&W COMMAND TO SAVE CHANGES TO Active (Saved), Customer 1, OR Customer 2
NOTE
THE AT&W COMMAND IS DISABLED IF THE StrapsWhenDisc CONFIGURATION OPTION IS SET TO Reload
Active (Saved) (AT&W0)
Customer 1 (AT&W1)
Customer 2 (AT&W2)
494-13080-02

Figure 8-2. AT Command Configuration Process

Configure Branch

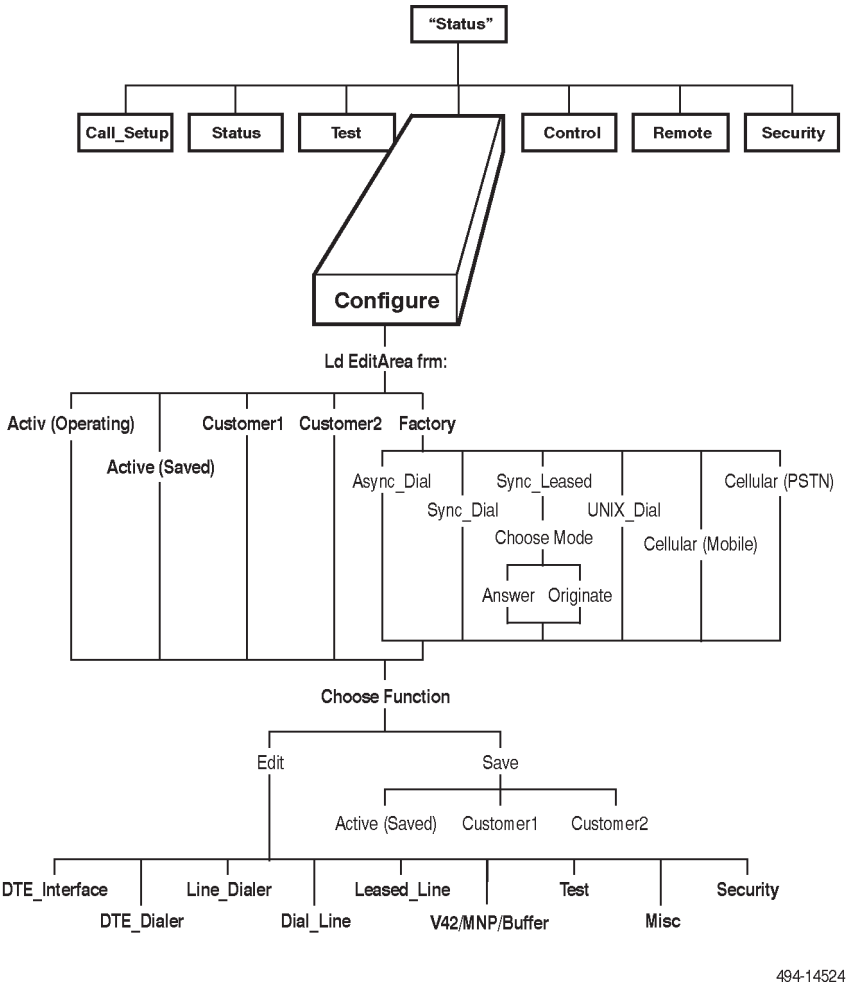
The Configure branch of the Top-Level menu contains all of the modem's configuration options (straps) which determine how the modem operates. These configuration options are accessed by scrolling down and across various levels of the Configure branch.

NOTE

The Cellular (Mobile) and Cellular (PSTN) factory configuration areas are available only if ETC is installed.

The Configure branch consists of the following three levels:

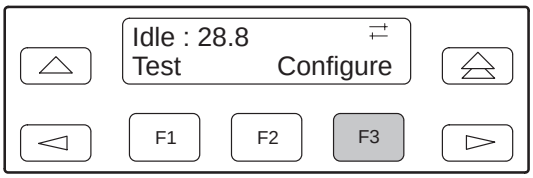
- **Ld EditArea frm.** Allows the selection of the Active (Operating), Active (Saved), Customer 1, Customer 2, and Factory configuration areas.
- **Choose Function.** Allows you to make changes (Edit) to existing configuration options or write (Save) these changes to either the Active (Saved), Customer 1, or Customer 2 configuration area.
- **Edit Strap Group.** Contains the eight software configuration option groups that determine how the modem operates.



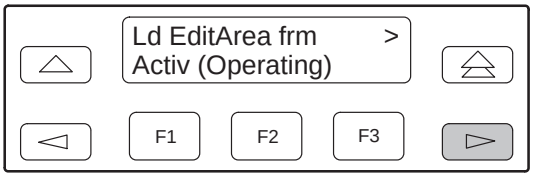
494-14524

Editing and Saving a Configuration Option

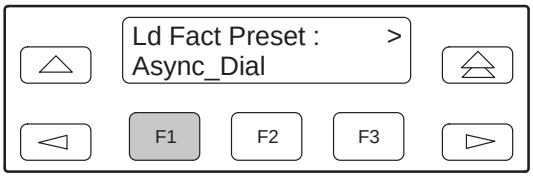
The following example shows how to change the Remote Access Password using the DCP. (If you ever intend to access another 3800*Plus* Series modem via the Remote branch of the Top-Level menu, the Remote Access Password must be the same for both modems.) By following these procedures you learn how to load a factory preset configuration area (in this case, Async Dial), how to edit a configuration option (Remote Access Password), and how to save changes to a configuration area (Active (Saved)). The shaded key indicates what key to press.



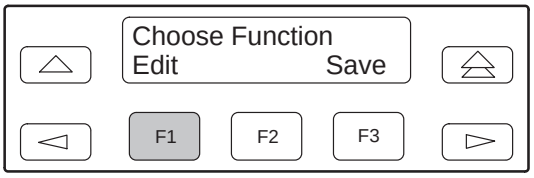
Select Configure from the Top-Level menu.



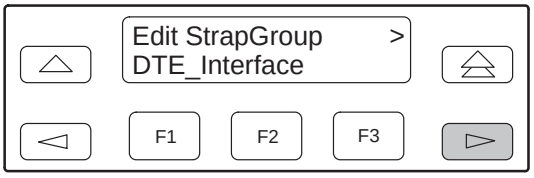
Select the Factory configuration area.



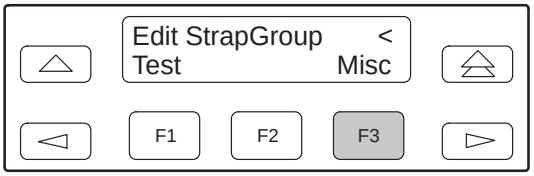
Select Async_Dial.

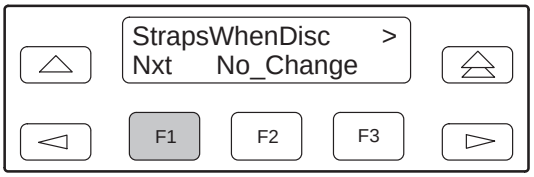


Select Edit.

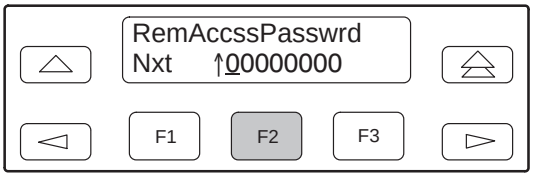


Scroll to and select the Misc configuration options group.

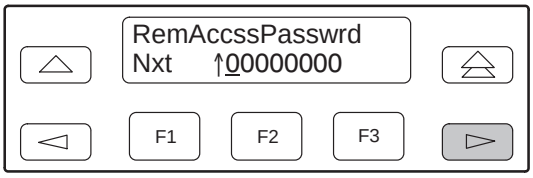




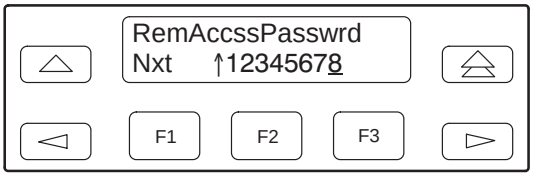
Select Nxt until RemAccssPasswrd appears.



Select the F2 (↑) key to increment password values.

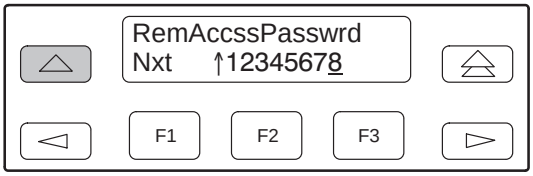


Press the ▻ key to move the cursor to the next position.

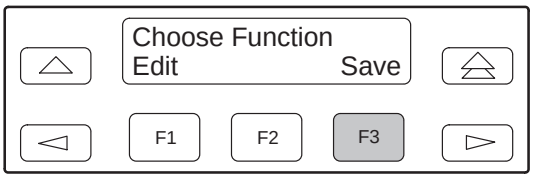


Continue this sequence until you have entered the new password value.

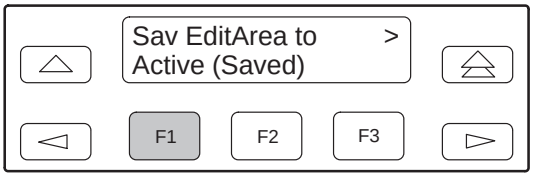
To save the new password to a configuration area, make the following selections.



Press the △ key to scroll up (twice).



Select Save.



Select a configuration area (Active (Saved), Customer 1, or Customer 2) by using the ▻ key. Press F1 or F2 to save the changes.

Select the ⏢ key to exit to the Top-Level menu or select the △ key to remain in the Configure branch.

Summary

When using the DCP to edit configuration options, keep the following in mind:

- **Nxt** has two functions. First, it indicates that more configuration options are available within that group. These are accessed by selecting Nxt (pressing F1) and scrolling down to the next configuration option. Second, it indicates that what is displayed on the LCD is the current setting. If you scroll left or right, Nxt disappears and reappears if a new value is selected.
- **End** appears when you have scrolled down to the last configuration option available in that group. Selecting End returns you to the top of the configuration group. You are free to enter that group again or scroll left or right to the next configuration options group.
- The △ key takes you one step up in the Configure branch each time it is pressed.
- The ⏢ key causes you to exit the Configure branch and return to the Top-Level menu. If any changes are made to configuration options, the DCP allows you to save these changes to either the Active (Saved), Customer 1, or Customer 2 configuration areas.
- The ◅ and ▻ keys move selections across the LCD.
- The function keys (F1, F2, F3) select the LCD choice that appears above that function key.

Configuration Tables

The modem's configuration options are arranged into eight groups based upon functionality: DTE Interface (Table 8-1), DTE Dialer (Table 8-2), Line Dialer (Table 8-3), Dial Line (Table 8-4), Leased Line (Table 8-5), V.42/MNP/Buffer (Table 8-6), Test (Table 8-7), and Misc (Table 8-8).

Throughout these tables, two selections frequently appear on the LCD: Enable and Disable. Unless otherwise stated, Enable selects a configuration option and makes it available for use; Disable makes a configuration option unavailable for use.

The remainder of this chapter discusses each configuration options group in detail, listing factory defaults, definitions, and AT command equivalents.

DTE Interface

The DTE Interface configuration options contain RS-232D (ITU-T V.24) and asynchronous character format information essential for maintaining a connection and for transmitting data between the DTE and the modem.

Table 8-1 shows each DTE Interface configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-1
(1 of 7)
DTE Interface Configuration Options

Async/Sync Mode: Async **Nxt Async Sync**
Asynchronous/Synchronous Mode. Determines whether the modem operates in Asynchronous mode or Synchronous mode. If the AT command set is enabled and this configuration option is set for Sync, then the modem operates in Async mode when offline. For Async Dial and UNIX Dial, Async is the factory default. For Sync Dial and Sync Leased, Sync is the factory default. AT command equivalents are &M*n* and &Q*n*.
Async DTE Rate:19200 **Nxt 19200 115200 76800 57600 38400 28800 14400 12000 9600 7200 4800 2400 1200 0–300**
This configuration option only appears if Async/Sync Mode is configured for Async. Asynchronous DTE Data Rate. Identifies the asynchronous DTE's operating rate to the modem. Data rates from 115,200 bps to 300 bps are supported. To originate calls in 76,800 bps Sun Workstation environments, use either DCP dialing, DTR dialing, or handset dialing. The modem does not support AT command dialing at this data rate. To prevent losing data in 115,200 bps applications, a 16650 (or faster) UART on the PC's serial port is required, as well as a communications package which can take advantage of its 16-byte buffer. In addition, a 386 25-MHz (or faster) PC is required, and the RS-232 cable must be 6 feet or less to minimize capacitance. **NOTE:** This configuration option is ignored in Async Direct mode and synchronous mode since the DTE rate always equals the VF rate. The factory default is 19200 bps. There is no AT command equivalent; AT prefix determines Async DTE Rate.

Table 8-1
(2 of 7)
DTE Interface Configuration Options

Sync DTE Rate:128000

Nxt 128000 115200 112000 96000 76800 72000 64000 57600 56000 48000 38400 28800 19200 14400 9600 4800 2400 1200

This configuration option only appears if SDC is enabled.

Synchronous DTE Data Rate. Determines the bit rate of data transferred between the synchronous DTE and the modem during SDC operation. Data rates from 128,000 to 1200 bps are supported.

NOTE: A cable less than fifty feet in length is required for rates over 19,200 bps. Data synchronization at rates over 57,600 bps is sensitive to cable length and capacitance, and the DTE's drivers and receivers. External transmit clocking may be required.

The factory default is 128000 bps.

The AT command equivalent is S30=*n*.

Data Bits: 8

Nxt 8 7 9(DirectMde) 6(DirectMde)

Number of Data Bits. Determines if data bytes are composed of 6, 7, 8, or 9 data bits. This data length excludes start, parity, and stop bits.

8 – Sets data length to 8 data bits.

7 – Sets data length to 7 data bits.

9(DirectMde) – Sets data length to 9 data bits. Only valid when Error Control configuration option is set to Direct Mode.

6(DirectMde) – Sets data length to 6 data bits. Only valid when Error Control configuration option is set to Direct Mode.

The factory default (for Sync Dial) is 7 data bits.

NOTE: If the DTE Dialer Type configuration option is set for AT or V.25bis Async, then the total character size must equal 10 bits (see DTE Dialer configuration options group in the user's guide). Total character size consists of an asynchronous start bit, asynchronous number of data bits, parity bits, and asynchronous stop bits. For V.25bis Bisync or HDLC operation with a V.25bis compliant DTE, the number of data bits should be set to 7. The total character size for Error Control mode or Buffer mode must be 10 bits. The total character size for Direct mode must be 11 bits or less.

There is no AT command equivalent; AT prefix determines the async character length.

Parity Bit: None

Nxt None Even Odd Mark Space

Parity Bit. Determines the type of parity bit. The parity of the DTE must match the parity of the modem. Parity options include None, Even, Odd, Mark, or Space.

None – No parity bit is used.

Even – Parity bit is set so that total number of 1's in data bits plus parity bit is even.

Odd – Parity bit is set so that total number of 1's in data bits plus parity bit is odd.

Mark – Parity bit is always set to 1. Only valid if # Data Bits configuration option is set to 7.

Space – Parity bit is always set to 0. Only valid if # Data Bits configuration option is set to 7.

The factory default (for Sync Dial) is Odd.

NOTE: If the DTE Dialer Type configuration option is set for AT or V.25bis Async, then the total character size must equal 10 bits (see DTE Dialer configuration options group in the user's guide). Total character size consists of an asynchronous start bit, asynchronous number of data bits, parity bits, and asynchronous stop bits. For V.25bis Bisync or HDLC operation with a V.25bis-compliant DTE, parity should be set to Odd. The total character size for Error Control mode or Buffer mode must be 10 bits. The total character size for Direct mode must be 11 bits or less.

There is no AT command equivalent; AT prefix determines parity of the async character.

Table 8-1
(3 of 7)
DTE Interface Configuration Options

 # Stop Bits: 1
Nxt 1 2

Number of Stop Bits. Selects 1 or 2 bits to signal the end of an asynchronous character.

The factory default is 1.

There is no AT command equivalent; AT prefix determines the number of stop bits via autobauding.

DTR Action: Ignore
Nxt Stndrd_RS232 Ignore CntrlsOnHook Off=ReloadStrp Off=CmdMode CntrlsTXMute

Data Terminal Ready Action. DTR is a signal from the DTE to the modem indicating that the DTE is connected and ready for operation.

Standard RS232 – Allows the DTE to control DTR to the modem as specified in RS-232D and ITU-T V.24 specifications. If this signal is not present, the modem will not answer or dial.

Ignore – Modem assumes DTR is always ON. This is used when DTE does not provide DTR to the modem.

CntrlsOnHook – Modem does not disconnect from the VF line during an active call until DTR is lowered by the attached DTE. This setting is required for applications in which the host processor must reset itself for the next session before the current session is terminated. The setting is ignored if the modem receives a disconnect command from the SDCP or from the COMSPHERE 6700 Series NMS.

Off=ReloadStrp – Like Standard RS232, except that when DTR is lowered the modem loads the Active (Saved) area into the Active (Operating) area.

Off=CmdMode – When the modem is online and DTR is Off for longer than the period specified by the S25 register, the modem enters online Command mode. The ATO command must be issued to return to data mode. This setting has the same effect as Ignore if AT commands are disabled.

CntrlsTXMute – Like Standard RS232, except that when DTR is lowered at the answering modem, the modem mutes transmitter output. For leased line V.34, V.32bis, or V.32 operation only.

NOTE: If V.25bis mode is used, then this configuration option must be set for Stndrd_RS232. The DTE must provide DTR to dial or answer a call.

When operating over the dial network, this selection forces DTR Action to behave as CT108/2 (Data Terminal Ready). If DTE Dialer Type configuration option is set to DTR=Direct 1, then DTR Action behaves as CT108/1 (Connect Data Set to Line).

For Async Dial, Sync Leased, and UNIX Dial, Ignore is the factory default.

For Sync Dial, Stndrd_RS232 is the factory default.

The AT command equivalent is &D*n*.

Table 8-1
(4 of 7)
DTE Interface Configuration Options

DSR Control: Forced_On

Nxt Forced_On Stndrd_RS232 WinkWhenDisc Follows_DTR On_Early Delay_ToData DialBkToggle

Data Data Set Ready Control. DSR is a signal from the modem to the DTE indicating the modem is connected and ready for operation.

Forced On – Forces DSR output ON constantly. This is usually used for leased-line applications and when the DTE requires DSR to always be ON.

Standard RS232 – Allows the modem to control DSR to the DTE. The modem raises DSR when it begins the handshake process. DSR lowers upon disconnect. The modem is not ready to receive data until DSR, CTS, and LSD are active.

An ON state indicates to the DTE that the modem is ready to receive data. An Off state indicates that the modem is not ready to receive data, and the DTE will not send data to the modem. During a Local Analog Loop and a Remote Digital Loop, DSR is ON.

Wink When Disconnect – DSR is normally forced ON, but is turned Off for 1 to 2 seconds upon a disconnect.

Follows DTR – When the modem receives DTR from the DTE, it sends DSR to the DTE.

On Early – DSR is low when the modem is in the idle state. DSR goes high immediately upon a command to enter Data mode. This setting is required for some modem pooling applications.

Delay to Data – Operation is similar to the Standard RS232 setting except that DSR does not turn ON until the modem enters Data mode. Normally, the modem raises DSR when it begins the handshaking process.

Use this setting when the DTE cannot operate with a long DSR-to-CTS delay (common for V.32bis modulation) or when dial access security is enabled and requires a DTE-side password entry. Often, the DTE cannot accept the long delay between DSR and CTS turning ON due to the remote user entering the DTE-side password.

Dial Backup Toggle – DSR is turned Off during a dial backup attempt in Leased mode, and ON when such an attempt completes. DSR is also turned Off when a disconnect begins, and turned ON when the disconnect is complete.

For Async Dial and UNIX Dial, Forced_On is the factory default.

For Sync Dial and Sync Leased, Stndrd_RS232 is the factory default.

AT command equivalent is &S*n*.

Table 8-1
(5 of 7)
DTE Interface Configuration Options

RTS Action: Ignore

Nxt Ignore Stndrd_RS232 Sim_Cntl_Car Cntl_Car

Request-to-Send Action. RTS is a signal from the DTE to the modem indicating the DTE has data to send to the modem.

Ignore – Modem assumes RTS is always ON. Use this selection when the DTE does not provide RTS to the modem.

Standard RS232 – Allows the DTE to control RTS to the modem in normal RS-232D operation. RTS must be ON for the DTE to transmit to the modem.

Simulated Control Carrier – RTS input controls the remote modem's LSD signal. This is used for DTEs that require Line Signal Detect (LSD) to toggle ON and Off to simulate half-duplex operation. Valid only in Synchronous mode and Asynchronous Direct mode.

NOTE: If RTS Action is set for simulated control carrier, then the remote modem's LSD Control configuration option must be set for Simulated Control Carrier. Simulated Control Carrier conforms to V.13 specifications. This setting is ignored when the modem is configured for Asynchronous mode and RTS/CTS flow control is selected.

Control Carrier – Allows the DTE's RTS signal to control the modem's carrier signal. When RTS is ON, carrier is present on the VF line. When RTS turns Off, carrier is no longer present. This is only valid for V.29 leased-line modulation.

For Async Dial and UNIX Dial, Ignore is the factory default.

For Sync Dial and Sync Leased, Stndrd_RS232 is the factory default.

AT command equivalent is &R*n*.

CTS Control: Forced_On

Nxt Forced_On Stndrd_RS232 WinkWhenDisc Follows_DTR

Clear-to-Send Control. CTS is a signal from the modem to the DTE indicating that it can accept data from the DTE.

NOTE: When CTS flow control or CTS/RTS flow control is enabled, CTS will turn ON and Off regardless of the setting of CTS Control.

Forced On – CTS is forced ON at all times. Use this selection for most asynchronous applications.

Standard RS232 – In Synchronous mode, forces the state of CTS to follow the state of RTS in normal RS-232D operation. The minimum time that elapses between CTS and RTS is determined by the RTS/CTS Delay configuration option. Use this setting for most synchronous applications.

In AT Command mode, CTS (which is ON in Idle mode) goes Off just prior to DSR going active, and goes ON when the modem enters Data mode. This operation prevents losing data in applications which begin transmitting as soon as DSR and CTS are both active.

Wink When Disconnect – CTS is normally forced ON, but is turned Off for 1 to 2 seconds upon a disconnect. Use this for most UNIX applications.

Follows DTR – The state of CTS follows the state of DTR. When DTR turns ON, CTS turns ON. When DTR turns Off, CTS turns Off.

For Async Dial, Forced On is the factory default.

For Sync Dial and Sync Leased, Stndrd_RS232 is the factory default.

For UNIX Dial, WinkWhenDisc is the factory default.

AT command equivalent is \D*n*.

Table 8-1
(6 of 7)
DTE Interface Configuration Options

RTS/CTS Delay: 0 msec

Nxt 0msec 10msec 50msec 150msec 600msec

Request-to-Send/Clear-to-Send Delay. RTS/CTS Delay sets the delay time between the modem receiving RTS from the DTE and the modem sending CTS to the DTE.

This delay is only valid in Async Direct mode and synchronous applications when it is necessary to have a short delay between the time the DTE raises RTS and the time the modem presents CTS to allow the DTE to send data.

NOTE: For this configuration option to be valid, both the RTS Action and the CTS Control configuration options must be set for Stndrd RS232. If RTS Action is set for Ignore, RTS is always ON and this configuration option has no effect.

The factory default is 0 milliseconds.

AT command equivalent is S-register S26=*n*.

LSD Control: Stndrd_RS232

Nxt Stndrd_RS232 Forced_On WinkWhenDisc Follows_DTR Sim_Cntl_Car =DTR/DiscOff BridgeRetrain

Line Signal Detect Control. LSD is a signal indicating that the carrier signal is being received from the remote modem. It is normally turned Off to the DTE when the power level of the received carrier signal drops below the carrier detect threshold.

Standard RS232 – LSD is ON when the modem detects the remote modem's carrier signal. LSD turns Off when the carrier signal strength drops below carrier detect threshold.

Forced On – Forces LSD to be ON at all times.

Wink When Disconnect – LSD is normally forced ON, but can be turned Off for 1 to 2 seconds upon a disconnect. This is used for UNIX DTEs.

Follows DTR – The state of LSD follows the state of DTR. When DTR turns ON, LSD turns ON. When DTR turns Off, LSD turns Off.

Simulated Control Carrier – LSD follows the state of RTS of the remote DTE via the V.13 simulated control carrier signaling. This is required for hosts that cannot support full-duplex operation. Valid only in Synchronous mode and Asynchronous Direct mode.

NOTE: If LSD Control is set for simulated control carrier, then the RTS Action configuration option on the remote modem must be set for Simulated Control Carrier.

=DTR/Disconnect Off – The state of LSD follows the state of DTR except when disconnecting once a connection is established. In this instance, DTR remains ON and LSD turns Off. DTR must then toggle Off and then ON again for LSD to turn ON. This setting is required for AT&T DATAKIT dial-out applications.

BridgeRetrain – LSD behaves as if it were set for Standard RS232, except that it is turned off when a retrain condition lasts longer than 10 seconds, and turned on again when no retrain condition is detected for a period of 10 seconds.

NOTE: If LSD Control is set for =DTR/DiscOff, then the DTR Action configuration option must be set for Stndrd_RS232.

For Async Dial, Sync Dial, and Sync Leased, Stndrd_RS232 is the factory default.

For UNIX Dial, WinkWhenDisc is the factory default.

AT command equivalent is &C*n*.

Table 8-1
(7 of 7)
DTE Interface Configuration Options

TX Clock Source: Internal

Nxt Internal External RXC_Loop

Transmit Clock Source. Determines the source of timing for synchronous data transmitted from the DTE.

Internal – The transmit data's clock source is derived from the modem's internal clock and output on Pin 15 (TXC) of the RS-232D interface.

External – The transmit data's clock source is provided by the DTE on Pin 24 (EXT) on the RS-232D interface. This configuration option automatically disables Autorate, Automode, and Asymmetric Rate mode when running V.34 modulation.

RXC Loop – The modem's transmit clock is derived from its received signal and is output on Pin 15 (TXC) of the RS-232D interface. RXC Loop does not appear if SDC is enabled.

NOTE: This configuration option only appears if Async/Sync Mode is configured for Sync.

The factory default is Internal.

AT command equivalent is &X*n*.

CT111_Rate Cntl: Disable

Nxt Disable Fallback1 Fallback2

CT111 Rate Control. Allows the DTE to control modem rate via Pin 23 of the RS-232D interface. This configuration option determines the effect of the DTE Rate control signal. CT111 is also known as CH on the RS-232D interface.

Disable – Disregards CT111 Rate Control.

Fallback1 – Forces the modem to decrease its configured data rate to the next lower data rate when CT111 is Off. Valid only for V.32bis, V.33, V.29 modulation. Modem will only fall back within the same modulation scheme. When CT111 turns ON, the modem returns to its previous data rate.

Fallback2 – Forces the modem to decrease two data rates while remaining in the same modulation scheme. When CT111 turns ON, the modem returns to its previous data rate.

NOTE: This configuration option is only valid in Async Direct mode and Synchronous mode. For proper operation, disable the Autorate and Automode configuration options. CT111 Rate Control is not supported with V.34.

The factory default is Disable.

AT command equivalent is S-register S61=*n*.

DTE Rate=VF: Disable

End Disable Enable

DTE Rate = VF Rate. Forces the data rate of the connection between the DTE (computer) and the modem to be the same as the VF (telephone line) rate.

Disable – The DTE rate is the value of the Async DTE Rate configuration option.

Enable – The DTE rate is identical with the VF rate.

NOTE: Not all DTE rates are available in Async Dial Direct Mode. This configuration option has no effect if Async/Sync Mode is set for Sync or if V.42/MNP/Buffer is set to DirectMode.

The factory default is Disable.

AT command equivalent is S-register S90=*n*.

DTE Dialer

The DTE Dialer configuration options establish the DTE-to-modem protocol for call establishment and control.

Table 8-2 shows each DTE Dialer configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-2
(1 of 5)
DTE Dialer Configuration Options

DTE Dialer Type: AT **Nxt AT Disable V25bis_Async V25bis_Bsync V25bis_HDLC DTR=Dirs AT&T_Exclusve DTR=Backup**
Data Terminal Equipment Dialer Type. Identifies to the modem the type of dialing method and protocol used by the DTE.
AT – Allows AT command protocol to be used as a method for entering commands and dialing when used in an asynchronous application.
NOTE: The modem will not respond to AT commands if DTE Dialer Type is not set for AT.
Disable – Disables any type of DTE dialing method. Dialing can only be performed using the DCP's Dial command or attached telephone.
V.25bis Async – Selects V.25bis Async as the dialing method and protocol used by the modem. The character length must be 7 data bits with even parity and 1 stop bit.
V.25bis Bisync – Selects V.25bis Bisync as the dialing method and protocol used by the modem. This is also known as character-oriented protocol. This framing protocol uses two synchronous control characters and a start-of-text control character before the text block and an end-of-text control character after the text block. The character length must be 7 data bits with odd parity and 1 stop bit.
V.25bis HDLC – Selects V.25bis HDLC as the dialing method and protocol used by the modem. This is also known as bit-oriented protocol. This framing protocol uses flag, address and control characters before the text block and a frame sequence check and flag after the text block.
DTR=Dirs – Allows the modem to automatically dial the number stored in directory location 1 whenever DTR turns ON.
NOTE: DTR dialing should not be used if dial access security is enabled.
AT&T Exclusive – Enables a subset of the proprietary AT&T command set, which is required for some applications that use AT&T equipment. Currently, the only application supported is AT&T DATAKIT.
DTR=Backup – Allows the modem to automatically dial the number stored in directory location 1 whenever DTR turns ON and the leased line is down.
For Async Dial and UNIX Dial, AT is the factory default.
For Sync Dial and Sync Leased, Disable is the factory default.
AT command equivalent is &M*n* and &Q*n*.

Table 8-2
(2 of 5)
DTE Dialer Configuration Options

***AT Escape Char: 043 ASCI** **Nxt ↑ 043 ASCI**
AT Escape Character. The escape sequence (+++) allows you to move back and forth between Command mode and Data mode. The ASCII value of the escape character (43 ASCII) can be set to any ASCII value from 0 ASCII to 255 ASCII. However, the escape character is disabled if a value greater than 127 ASCII is entered. When disabled, the call must be disconnected to return to Command mode. The factory default is 43 (ASCII AT escape character). AT command equivalent is S-register S2=*n.*
***Escape GuardTim: 1sec** **Nxt 1sec 200msec 400msec 600msec 800msec 2sec**
Escape Guard Time. Determines the length of the required pause before and after the escape sequence is issued. The guard time prevents the modem from interpreting data as the escape sequence characters. The factory default is 1 second. AT command equivalent is S-register S12=*n*.
***BreakForceEscap:** **Disable Nxt Disable Enable**
Break Forces Escape. Determines whether or not the modem should enter Command mode when it receives a break character from the DTE. **Disable** – A break character is sent to the remote end. **Enable** – Modem escapes into AT Command mode, and a break character is not sent to the remote end. The factory default is Disable. AT command equivalent is \K*n*.
***CommandCharEcho: Enable** **Nxt EnableDisable**
Command Character Echo. Controls whether or not characters are echoed back to the DTE when the modem is in Command mode. The factory default is Enable. AT command equivalent is E*n*.
***CarriageRtn Char: 013 ASCI** **Nxt ↑ 013 ASCI**
Carriage Return Character. Allows you to change the ASCII character used to terminate an AT command to any ASCII value from 0 to 127. The factory default is 13 (ASCII carriage return). AT command equivalent is S-register S3=*n*.
* This configuration option only appears if DTE Dialer Type is configured for AT.

Table 8-2
(3 of 5)
DTE Dialer Configuration Options

***Backspace Char: 008 ASCI**
Nxt ↑ 008 ASCI

Backspace Character. Sets the character used to perform a backspace in Command mode.

The factory default is 08 (ASCII backspace character).

AT command equivalent is S-register S5=*n*.

***Linefeed Char: 010 ASCI**
Nxt ↑ 010 ASCI

Line Feed Character. Sets the character used to perform a line feed in Command mode for responses from the modem.

The factory default is 10 (ASCII line feed character).

AT command equivalent is S-register S4=*n*.

***Result Codes: Enable**
Nxt Enable Disable EnableInOrig

Result Codes. Result codes are informational messages (such as Connect and Ring) sent from the modem and displayed on the asynchronous DTE terminal. (For a list of Result Codes, refer to Table 13-1 in Chapter 13, *AT Commands and S-Registers*.)

Enable – Modem sends result codes to the DTE.

Disable – Modem does not send result codes to the DTE.

EnableInOrig – For UNIX applications, enable result codes only on the originating modem. This prevents the DTE on the answer side from interpreting result codes as login attempts.

For Async Dial, Enable is the factory default.

For UNIX Dial, EnableInOrig is the factory default.

AT command equivalent is Q*n*.

***ExtendResltCode: Enable**
Nxt Enable Disable Add/EC Add/V42,MNP Use_DTE_Rate

Extended Result Codes. Informational messages such as VF data rate and Error Control are displayed with the result codes. (For a list of Extended Result Codes, refer to Table 13-1 in Chapter 13, *AT Commands and S-Registers*.)

Enable – **NO DIALTONE, BUSY, NO ANSWER**, and **CONNECT xxxx** (xxxx = VF data rate) are displayed along with result codes listed in Table 13-1 in Chapter 13, *AT Commands and S-Registers*.

Disable – Only **OK, CONNECT, RING, NO CARRIER,** and **ERROR** result codes appear.

NOTE: NO DIALTONE is valid only if Dial Tone Detect configuration option is enabled. BUSY appears if Busy Detect configuration option is enabled.

Add/EC – Places the EC suffix after the result code text if error control is used. For example, CONNECT 9600/EC

Add/V.42, MNP – Places either the /V.42 or /MNP suffix after the result code text if data compression is used. For example, CONNECT 9600/V42b.

Use DTE Rate – Allows the DTE rate to be displayed in the Connect message instead of the line rate. This feature is required in some modem pooling applications.

The factory default is Enable.

AT command equivalent is X*n*.

* This configuration option only appears if DTE Dialer Type is configured for AT.

Table 8-2
(4 of 5)
DTE Dialer Configuration Options

***ResultCode Form: Words** **Nxt Words Numbers (1) Numbers (2)**
Result Codes Format. Controls whether or not result codes appear as words or as numeric codes. Some DTEs do not recognize Result Codes as words; therefore, numbers are required. The Numbers (2) format is required for some modem pooling applications. (For a list of Result Codes, refer to Appendix B.) The factory default is Words. AT command equivalent is V*n*.
V25bis Coding: ASCII **Nxt ASCII EBCDIC**
V.25bis Coding. Identifies to the modem whether the DTE is using ASCII code or EBCDIC code for V.25bis commands. The modem responds to the DTE using the same coding. **NOTE:** This configuration option only appears if DTE Dialer is configured for V25bis HDLC or V25bis Bisync. The factory default is ASCII. AT command equivalent is S-register S62=*n.*
V25bis IdleFill: Mark **Nxt Mark Flag**
V.25bis Idle Fill. Determines whether a mark or flag is used as an idle fill character for the DTE. The modem responds to the DTE using the same idle fill. **NOTE:** This configuration option only appears if DTE Dialer is configured for V25bis HDLC. The factory default is Mark. AT command equivalent is S-register S63=*n.*
V.25b NewLineChr: CR+LF **Nxt CR+LF CR LF**
V.25bis New Line Character. Sets the modem for the command line terminator used by the DTE in V.25bis Async mode. The modem responds to the DTE using the same line terminator. **NOTE:** This configuration option only appears if DTE Dialer is configured for V25bis Async. The factory default is CR+LF. AT command equivalent is S-register S64=*n.*
* This configuration option only appears if DTE Dialer Type is configured for AT.

Table 8-2
(5 of 5)
DTE Dialer Configuration Options

***AT Cmnd Mode: Normal**
Nxt Normal No_ERROR NoStrapOrERR

AT Command Mode. Determines how the modem responds to valid and invalid AT commands.

NOTE: Since this configuration option affects AT commands, it cannot be changed by the AT&F command. However, it can be changed by selecting a factory preset configuration via the DCP.

Normal – Allows normal operation of the AT command set. The modem acts upon all valid AT commands and issues the ERROR result code for invalid commands. If a string with multiple commands is entered, then an invalid command within that string will prevent the execution of subsequent valid commands.

No ERROR – Operates similar to Normal mode, however, the modem does not issue an ERROR result code for invalid commands. When an invalid command equivalent is encountered, the modem ignores it and issues the OK result code. If a string with multiple commands is entered, then an invalid command within that string will not prevent the execution of subsequent valid commands.

No Strap or ERROR – Ignores all AT commands (including valid commands) that cause a configuration option to change. Only nonconfiguring commands (for example ATD, ATA, and ATI) are executed; the ERROR result code is never returned.

The factory default is Normal.

AT command equivalent is S-register S84=*n*

DTR Cont Repeat: Disable
End Disable Enable

DTR Cont Repeat. Determines whether automatic redialing stops after the directory locations defined by DTR Auto Redial (S37) have all been tried unsuccessfully once. If DTR Cont Repeat is enabled, automatic redialing starts again with directory location 1. The default is Disable.

A redial attempt is made in response to a bad phone number, a busy signal, no answer, or no quiet answer. However, a lockout from redialing occurs if ten successive failing call attempts are made to the same number.

DTR Cont Repeat is accessible only if the DTE Dialer Type is DTR=Dirs.

Disable – Automatic redialing will not be repeated.

Enable – Automatic will be repeated if necessary.

AT command equivalent is S-register S38=*n*.

* This configuration option only appears if DTE Dialer Type is configured for AT.

Line Dialer

The Line Dialer configuration options establish parameters used by the modem to answer or originate calls.

Table 8-3 shows each Line Dialer configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-3
(1 of 5)
Line Dialer Configuration Options

AutoAnswerRing#: 1 **Nxt 1 Disable 2 4 6 8 10**
Auto-Answer Ring Count. Determines the number of rings necessary before the answering modem answers an incoming call. For example, if this option is set for 2, then the answering modem answers after the second ring. **NOTE:** Although DCP selections are limited (1, 2, 4, 6, 8, or 10), values set by AT commands can display from 1 to 255 rings. **Disable** – If selected, the modem must be answered using either the DCP's Answer command or via AT commands. The factory default is 1. AT command equivalent is S*n*.
Dialer Type: Tone **Nxt Tone Pulse**
Dialer Type. Selects either tone (DTMF) dialing or pulse (rotary) dialing mode. The factory default is Tone. AT command equivalents are the Dial command modifiers T and P.
DialTone Detect: Enable **Nxt Enable Disable**
Dial Tone Detect. Sets the modem for dial tone detection (enable) or blind dialing (disable). **Enable** – Modem disconnects the call if a dial tone is not detected within 10 seconds and displays **No Dial Tone** on both the LCD and asynchronous DTE terminal. **Disable** – Modem dials a call whether or not it detects a dial tone on the line. This is known as blind dialing. The period of time the modem waits before dialing is specified in the Blind Dial Pause configuration option. The factory default is Enable. AT command equivalent is X*n*.
Blind Dial Paus: 2sec **Nxt 2sec 4sec 6sec 8sec 10sec 20sec**
Blind Dial Pause. Determines how long the modem waits before dialing a telephone number when DialTone Detect is disabled. **NOTE:** The Blind Dial Pause configuration option only appears when the Dial Tone Detect configuration option is disabled. The factory default is 2sec. AT command equivalent is S-register S6=*n*.

Table 8-3
(2 of 5)
Line Dialer Configuration Options

BusyTone Detect: Enable
Nxt Enable Disable

Busy Tone Detect. Sets the modem to monitor for Busy Tone (Enable) or ignore Busy Tone (Disable).

This configuration option is normally enabled; however, if the modem receives false busy tones, this configuration option can be disabled and the modem ignores all busy tones.

The factory default is Enable.

AT command equivalent is X*n*.

"," Pause Time: 2sec
Nxt 2sec 4sec 6sec 8sec 10sec 20sec

Pause Time. Determines the number of seconds the modem pauses when it encounters a comma (,) in the dial command string.

NOTE: Although DCP selections are limited (2, 4, 6, 8, 10, or 20), values set by the AT commands can display from 0 to 255 seconds.

The factory default is 2sec.

AT command equivalent is S-register S8=*n*.

NoAnswer Timout: 45sec
Nxt 45sec 30sec 60sec 120sec

No Answer Abort Time-out. Determines the number of seconds an originating modem waits before abandoning a call attempt when no answer tone is received.

NOTE: Although DCP selections are limited (30, 45, 60, or 120), values set by AT commands can display from 1 to 255 seconds.

The factory default is 45sec.

AT command equivalent is S-register S7=*n*.

Fast Disconnect: Disable
Nxt Disable Enable

Fast Disconnect. Allows the modem to disconnect immediately after receiving a disconnect command from a local DTE or its own diagnostic control panel.

Disable – The modem follows its normal disconnect sequence by issuing a cleardown sequence or long space disconnect. This is also known as a graceful disconnect since the other modem receives advance notice of a disconnection.

Enable – Use this setting if the DTE requires that the modem be made available as soon as possible after receiving a disconnect command.

NOTE: This abrupt method of disconnecting may cause problems with the remote modem, which may interpret the disconnection as an error instead of a valid disconnect.

The factory default is Disable.

AT command equivalent is S-register S85=*n*.

Table 8-3
(3 of 5)
Line Dialer Configuration Options

Long Space Disc: Enable

Nxt Enable Disable

Long Space Disconnect. Determines the modem's response to a continuous spacing condition sent from the remote modem when it goes on-hook. Issuing a long space is one method of disconnecting a call.

NOTE: This configuration option is ignored when the modem operates in Synchronous mode or Dial Backup mode.

Enable – Modem disconnects if it receives a continuous space from the DTE. The modem's transmitter will transmit 4 seconds of long space upon a disconnect.

Disable – Modem does not disconnect if it receives a continuous space from the DTE. Modem will not transmit a long space disconnect.

For Async Dial, UNIX Dial, and Sync Leased, Enable is the factory default.

For Sync Dial, Disable is the factory default.

AT command equivalent is Y*n*.

No Carrier Disc: 2sec

Nxt 2sec 5sec Disable 10sec 20sec

No Carrier Disconnect. If the modem no longer receives carrier from the remote modem, it disconnects the call. This configuration option determines how long carrier is Off before the modem disconnects. Loss of carrier is one method of disconnecting a call.

2, 5, 10, 20 sec – Modem disconnects if carrier turns Off for more than 2 seconds, 5 seconds, 10 seconds, or 20 seconds.

Disable – Modem does not disconnect if carrier turns Off.

The factory default is 2sec.

AT command equivalent is S-register S10=*n.*

No Data Disc: Disable

Nxt Disable 10min 30min 60min

No Data Disconnect. Forces the modem to disconnect if no data is transmitted or received within a specified amount of time.

Disable – Modem remains connected despite the lack of data flow.

10, 30, 60 min – Modem disconnects if data is not received or transmitted within 10-minute, 30-minute, or 60-minute intervals.

The factory default is Disable.

AT command equivalent is \T*n*.

Table 8-3
(4 of 5)
Line Dialer Configuration Options

NoDataDiscTrig: TXD and RXD

Nxt TXD and RXD TXD Only RXD Only TXD or RXD

No Data Disconnect Trigger Signal. Works in conjunction with No Data Disconnect (\T), and determines whether Pin 2 (transmit data) or Pin 3 (receive data) of the modem's RS-232 serial interface is monitored so that the modem can disconnect the call if there is no activity for a certain period of time.

The No Data Disconnect Trigger Signal configuration option is unavailable and is not displayed on the DCP when No Data Disconnect is disabled. The factory default is TXD or RXD. The reloading of factory defaults does not affect No Data Disconnect Trigger Signal.

TXD and RXD – Disconnect if no data transmitted and received for specified period.

TXD Only – Disconnect if no data transmitted for specified period.

RXD Only – Disconnect if no data received for specified period.

TXD or RXD – Disconnect if no data transmitted or received for specified period.

AT command is S80 = *n*:

S80 = 0 Transmit and Receive
S80 = 1 Transmit Only
S80 = 2 Receive Only
S80 = 3 Transmit or Receive

Auto Make Busy: Disable

Nxt Disable Enable

Automatic Make Busy. Forces the modem to go off-hook under the following conditions: a local analog loopback is performed, a self-test is performed, or if the modem is switched to the service line. This configuration option is valid only with the 3811*Plus* and does not appear on the LCD of standalone models.

NOTE: This configuration option should only be used when the modem is located behind a user's Private Branch Exchange (PBX). The Make Busy Network Interface Module (NIM) must be installed on the COMSPHERE 3000 Series Carrier. Refer to the *COMSPHERE 3000 Series Carrier, Installation Manual*.

The factory default is Disable.

AT command equivalent is S-register S40=*n*.

MakeBusyViaDTR: Disable

Nxt Disable Enable

Make Busy Via DTR. Determines if the modem goes off-hook when DTR is Off. Enable this setting if the DTE normally keeps DTR ON and turns DTR Off when the DTE cannot accept a call.

NOTE: This configuration option should only be used when the modem is located behind a user's Private Branch Exchange (PBX). For 3811*Plus* modems, the MakeBusy Network Interface Modules (NIMs) must be installed on the COMSPHERE 3000 Series Carrier. Refer to the *COMSPHERE 3000 Series Carrier, Installation Manual.*

The factory default is Disable.

AT command equivalent is S-register S69=*n*.

Table 8-3
(5 of 5)
Line Dialer Configuration Options

DTR Auto Redial: Dir 1

Nxt Dir 1 Dirs1-2 Dirs 1-3 Dirs 1-4 Dirs 1-5 Dirs 1-6 Dirs 1-7 Dirs 1-8 Dirs 1-9 Dirs 1-10

DTR Auto Redial. Defines the number of directory locations the modem may access when prior dialing attempts fail. For example, the selection Dirs1-10 means that all ten directory locations may be tied. The default is directory location 1 only.

DTR Auto Redial represents the same internal setting as that accessed with the Auto Redial configuration option in the Leased-Line group. However, DTR Auto Redial is in effect (and can be accessed) only if the DTE Dialer Type is DTR=Dirs.

Dir 1 – The modem will use only directory location 1 for automatic dial backups.

Dirs 1-2 – The modem will use directory location 2 in the event of call failure using directory location 1.

Dirs 1-3 – The modem will use directory location 3 in the event of call failure using the preceding entries.

- •
- •

Dirs 1-10 – The modem will use directory location 10 in the event of call failure using the preceding entries.

AT command equivalent is S37=*n.*

MI/MIC Dialing: Disable

End Disable Enable

MI/MIC Dialing. Also known as D-Lead signaling, is required by some PBX systems, older data phones, and security callback systems. It forces the modem into the originate handshake after first dialing a call.

Disable – Modem ignores activity on the MI/MIC contacts.

Enable – (3811*Plus* only.) When the MI/MIC contacts are closed, the modem goes into talk mode; when the contacts are open, the modem goes into data mode. A 26-pin D-Lead control connector located on the rear of the 3000 Series Carrier is used for MI/MIC Dialing for 3811*Plus* modems.

The factory default is Disable.

AT command equivalent is S-register S83=*n*.

Dial Line

The Dial Line configuration options are used to configure the modem for operation over dial lines.

Table 8-4 shows each Dial Line configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-4
(1 of 4)
Dial Line Configuration Options

Modulation: V34 **Nxt V34 V32bis/terbo V21/V22/BELL**
Modulation determines the modem's primary dial modulation group: V.34; V.32bis and V.32*terbo*; or V.21, V.22bis, V.22, Bell 212A, and Bell 103J. The factory default is V34 (V.34 modulations).
Dial LineRate: 33600(V34) **Nxt 33600(V34) 31200(V34) 28800(V34) 26400(V34) 24000(V34)** **21600(V34) 19200(V34) 16800(V34) 14400(V34) 12000(V34) 9600(V34) 7200(V34) 4800(V34) 2400(V34)** **- OR -** **Nxt 19200(V32t) 16800(V32t) 14400(V32b) 12000(V32b) 9600(V32b) 7200(V32b) 4800(V32b)** **- OR -** **Nxt 2400(V22bis) 1200(V22) 1200(212A) 0–300(V21) 0–300(103J)**
Dial Line Rate. This configuration option determines the modem's data rate and modulation scheme for operation on dial lines. Online changes do not take effect until a disconnect occurs. Dial Line Rate sets the upper limit rate and modulation; lower speed connections may still be possible. What Dial Line Rate configuration options are displayed depends the setting of Modulation. **33600(V34), 31200(V34), 28800(V34), 26400(V34), 24000(V34), 21600(V34), 19200(V34), 16800(V34), 14400(V34), 12000(V34), 9600(V34), 7200(V34), 4800(V34)** – The modem operates using V.34 modulation at the data rate selected. The modem can be forced by the remote modem to a lower data rate. Note that if Automode is enabled and Dial Line Rate is set to V.34, the modem can connect in a non-V.34 modulation. However, if Dial Line Rate is not set to V.34, it cannot be Automoded to V.34. **19200(V32t), 16800(V32t), 14400(V32b), 12000(V32b), 9600(V32b), 7200(V32b), 4800(V32b)** – The modem operates using V.32*terbo*, V.32bis, or V.32 modulation at the data rate selected. The modem can be forced by the remote modem to a lower data rate. **2400(V22bis), 1200(V22), 1200(212A)** – Modem operates using the modulation and data rate selected. **0–300(V21), 0–300(103J)** – Modem operates in full-duplex, Asynchronous mode. These data rates do not support V.42 or MNP® error control. The factory default is 28800(V34). AT command equivalent is S-register S41=*n.*

Table 8-4
(2 of 4)
Dial Line Configuration Options

Automode: Enable

Nxt Enable Disable System 85

Automode. Allows the modem to automatically detect the remote modem's modulation.

Enable – The modem automatically adapts to the modulation scheme and line rate of the remote modem, and the VF line condition. However, the maximum data rate the modem uses is determined by the Dial Line Rate configuration option. Bell 103J protocol is used for data rates of 0–300 bps.

Disable – Connection fails if the remote modem does not support the selected modulation.

System 85 – Modifies parameters used by the connection process. Specify System 85 only if your modem is in a modem pool attached to a System 85 Private Branch Exchange (PBX).

NOTE: Automode is automatically disabled in synchronous operation with the TX Clock Source set to External.

The factory default is Enable.

AT command equivalent is S-register S78 = *n*.

Autorate: Enable

Nxt Enable Disable StartAt48 StartAt96

Autorate. Controls the modem's ability to adjust its speed upward and downward to accommodate the conditions of the VF line.

Enable – Once connected, the modem automatically lowers the line rate if line conditions become impaired. When line conditions improve, the modem automatically shifts up to the highest data rate the line can support, limited by the value of the Dial Line Rate configuration option. This autorating only occurs between 4800 bps and 19,200 bps during V.32bis and V.32*terbo* connections and between 2400 bps and 33,600 bps during V.34 connections.

Disable – Line rate does not vary after the initial line rate selection during startup.

StartAt48, StartAt96 – Useful for lines with known noise problems, these settings cause the modem to connect at 4800 bps (StartAt48) or 9600 bps (StartAt96). If line conditions warrant it, the modem shifts up to the next higher rate until the value of Dial Line Rate or the highest possible rate for the line is reached.

NOTE: Autorate is automatically disabled in Async Dial Direct Mode or in synchronous operation with the TX Clock Source set to External.

The factory default is Enable.

AT command for Autorate is S-register S76=*n*.

Table 8-4
(3 of 4)
Dial Line Configuration Options

Dial TX Level: Permissv(–9)

Nxt Permissv(–9) –10 dBm –11 dBm –12 dBm –13 dBm –14 dBm –15 dBm –16 dBm –17 dBm –18 dBm –19 dBm –20 dBm –21 dBm –22 dBm –23 dBm –24 dBm –25 dBm –26 dBm –27 dBm –28 dBm –29 dBm –30 dBm –31 dBm –32 dBm ETC 1.0_Cell ETC 1.1_Cell

Dial Transmit Level. Sets the power output level of the transmit signal over dial lines.

Permissive (–9 dBm) – The modem transmits data at approximately –9 dBm. This is true whether the modem is connected to an RJ11-type permissive jack or to an RJ41 or RJ45 programmable jack.

ETC 1.0_Cell – Displayed only if Enhanced Throughput Cellular (ETC) is installed. Transmit level is automatically adjusted in response to line conditions according to the proprietary ETC 1.0 specification. Use only with remote modems set to ETC 1.0_Cell, and limit the data rate to 4800 bps.

ETC 1.1_Cell – Displayed only if ETC is installed. Transmit level is automatically adjusted in response to line conditions according to the proprietary ETC 1.1 specification.

The factory default is Permissv(–9).

AT command equivalent s are &I*n* and &J*n*.

V22b Guard Tone: Disable

Nxt Disable 550Hz 1800Hz

V.22bis Guard Tone. Determines whether the V.22bis guard tone is disabled, set to 550 Hz, or set to 1800 Hz.

Disable – No guard tone.

550 Hz or 1800 Hz – When the modem is in Answer mode, it transmits the guard tone at this frequency.

The factory default is Disable.

AT command equivalent is &G*n*.

Train Time: Long

Nxt Long Short

Train Time. Controls V.34, V.32*terbo*, V.32bis, and V.32 train. Determines whether minimum or maximum time durations are used during the handshaking sequence for both dial and leased line applications.

NOTE: This configuration option only appears when the Dial Line Rate configuration option is set for V.34, V.32*terbo*, V.32bis, or V.32.

Long – Selects long train. Use this setting whenever far-end frequency offset (phase roll) may be encountered. This is usually only required when transmitting over satellite links.

Short – Allows the modem to train-up faster.

The factory default is Long.

AT command equivalent is S-register S43=*n*.

Asymmetric Rate: Enable

Nxt Enable Disable

Asymmetric Rate. Controls rate symmetry when running V.34 modulation. (This configuration option does not appear unless V.34 modulation is selected.)

Enable – The modem operates in asymmetric rate mode (the transmit and receive rates can be different) when running V.34 modulation. Asymmetric Rate must be enabled in both modems.

Disable – The modem operates in symmetric rate mode (the transmit and receive rates are identical) when running V.34 modulation. Either modem can force symmetric mode by disabling Asymmetric Rate.

The factory default is Enable.

AT command equivalent is S-register S14=*n*.

Table 8-4
(4 of 4)
Dial Line Configuration Options

Proactive Retrain: Enable **Nxt Enable Disable**
Proactive Retrain. When enabled, the dial line connection is monitored, and if the Signal to Noise Ratio drops 1.2 dB or more, the modem forces a retrain. This may prevent bit errors at higher rates over marginal lines. Disabling Proactive Retrain reduces the number of retrains while increasing the exposure to bit errors. **NOTE:** This configuration option is valid only for dial lines at the V.34 rates 31200 and 33600. **Disable** – Proactive Retrain is disabled. **Enable** – Proactive Retrain is enabled. AT command equivalent is S23=*n*.
FallFwdDelay: Disable **End Disable 5_mins 15_mins 1_hour**
Fall Forward Delay. Provides an initial delay before leased or dial lines are monitored for fall forward conditions. After the timer expires, monitoring occurs as usual. Possible delay times are 5 minutes, 15 minutes, or 1 hour. The factory default is Disable (no delay). **NOTE:** Fall Forward Delay appears under both the Dial Line configuration options and the Leased Line configuration options, but the same setting is used for both. Changing it in one place effectively changes it in the other. There is no analogous AT command, so this configuration option is not available for modems without a shared or integral DCP.

Leased Line

The Leased Line configuration options are used to configure the modem for operation over leased lines.

> **NOTE**
>
> The Leased Line configuration group only appears if the modem is configured with the Sync Leased factory preset template.

The Leased Line configuration group only appears if the modem is configured with the Sync Leased factory preset template.

Table 8-5 shows each Leased Line configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-5
(1 of 5)
Leased Line Configuration Options

***Leased Mode: Disable** **Nxt Disable 4 Wire-Orig 4 Wire-Ans 2 Wire-Orig 2 Wire-Ans**
Leased Mode. Sets the modem for either 2-wire or 4-wire operation in Answer mode (receiving a call) or 2-wire or 4-wire operation in Originate (initiating a call) mode. **NOTE:** For proper operation over leased lines, one modem must be set for Originate mode, and the other modem must be set for Answer mode. For Sync Leased Answer Mode, 4-wire, Answer is the factory default. For Sync Leased Originate Mode, 4-wire, Originate is the factory default. AT command equivalent is &L*n*.
***Modulation: V34** **Nxt V34 V32bis/terbo V22bis V29/V33**
Modulation determines the modem's primary leased line modulation group: V.34; V.32bis and V.32*terbo*; V.22bis; or V.29 and V.33 (if installed). The factory default is V34 (V.34 modulations).
* This configuration option is only available if the Sync Leased factory preset template is selected.

Table 8-5
(2 of 5)
Leased Line Configuration Options

***LeasedLine Rate: 33600(V34)**

Nxt 33600(V34) 31200(V34) 28800(V34) 26400(V34) 24000(V34) 21600(V34) 19200(V34) 16800(V34) 14400(V34) 12000(V34) 9600(V34) 7200(V34) 4800(V34) 2400(V34)

- OR -

Nxt 19200(V32t) 16800(V32t) 14400(V32b) 12000(V32b) 9600(V32b) 7200(V32b) 4800(V32b)

- OR -

Nxt 2400(V22bis)

- OR -

Nxt 14400(V.33) 12000(V.33) 9600(V.29) 7200(V.29) 4800(V.29)

Leased-Line Rate. Determines the modem's data rate and modulation scheme for operation on leased lines. In Async mode, the DTE rate must equal the leased-line rate. Leased-Line Rate sets the upper limit rate and modulation; lower speed connections may still be possible.

What Leased-Line Rate configuration options are displayed depends the setting of Modulation.

33600(V34), 31200(V34), 28800(V34), 26400(V34), 24000(V34), 21600(V34), 19200(V34), 16800(V34), 14400(V34), 12000(V34), 9600(V34), 7200(V34), 4800(V34), 2400(V34) – These modulation schemes are available on 2-wire or 4-wire leased lines. The modem operates using V.34 modulation at the data rate selected. The modem can be forced by the remote modem to a lower data rate.

19200(V.32t), 16800(V32t), 14400(V.32bis), 12000(V.32bis), 9600 (V.32bis), 7200(V.32bis), 4800(V.32bis) – These modulation schemes are available on 2-wire or 4-wire leased lines. If a fixed V.32bis rate is selected, the modem can still be commanded to fall back by a remote modem.

2400(V.22bis) – This modulation scheme is available on 2-wire and 4-wire leased lines.

14400(V.33), 12000(V.33) – These modulation schemes are available only on 4-wire leased lines, and only with modems that have the optional V.33 Leased-Line feature installed.

9600(V.29), 7200(V.29), 4800(V.29) – These modulation schemes are available only on 4-wire leased lines, and only with modems that have the optional V.29 Leased-Line feature installed.

NOTE: It is recommended that both modems use the same fixed data rate.

The factory default is 28800(V34).

AT command equivalent is S-register S44=*n.*

***Autorate: Enable**

Nxt Enable Disable

Autorate. The modems adapt to VF line condition and connect at the optimum rate during initial line establishment. Once connected, the modem automatically lowers the line rate if line conditions become impaired. When line conditions improve, the modem automatically shifts up to the highest data rate the line can support. This autorating only occurs between 4800 bps and 19,200 bps during V.32bis and V.32*terbo* connections and between 2400 bps and 33,600 bps during V.34 connections.

The factory default is Enable.

AT command equivalent is S-register S82=*n.*

* This configuration option is only available if the Sync Leased factory preset template is selected.

Table 8-5
(3 of 5)
Leased Line Configuration Options

***Leased TX Level: 0**
Nxt 0 –1 –2 –3 –4 –5 –6 –7 –8 –9 –10 –11 –12 –13 –14 –15

Leased Transmit Level. Selects the modem's transmit power level over leased lines. The transmit output level can be selected in 1 dBm decrements from 0 dBm to –15 dBm.

For V.34 operation over two-wire connections, do not set Leased TX Level to a value higher than –9 dBm.

The factory default is 0 dBm.

AT command equivalent is S-register S45=*n*.

***BadLn Auto Orig: Disable**
Nxt Disable Enable FastBackup 2_min 5_min 10_min

Bad Lines Auto Originate. Allows the modem to dial backup telephone numbers (as determined by the Auto Redial configuration option) to restore communications with the remote modem when the leased lines fail.

This configuration option must be enabled in both the local and remote modem. The Answer mode modem must have its Auto-Answer Ring Number configuration option enabled. Refer to the Line Dialer configuration option group for information regarding Auto-Answer.

Disable – The modem will not perform a Bad Lines Auto Originate.

Enable – The modem will originate a call after 30 seconds of continuous bad-line conditions.

FastBackup – The modem will originate a call after 20 seconds of continuous bad-line conditions.

2_min – The modem will originate a call after 2 minutes of continuous bad-line conditions.

5_min – The modem will originate a call after 5 minutes of continuous bad-line conditions.

10_min – The modem will originate a call after 10 minutes of continuous bad-line conditions.

The factory default is Disable.

AT command equivalent is S-register S46=*n.*

***Rate Auto Orig: Disable**
Nxt Disable OnFlBkTo48 OnFlBkTo72 OnFlBkTo96 OnFlBkTo120 OnFlBkTo144 OnFlBkTo168

Rate Auto Originate. Initiates a dial backup call, using the phone number in directory location 1, when the leased-line rate of the modem falls back to or below a certain speed.

Disable – The modem will not perform a Rate Auto Originate.

OnFlBkTo48 – If the leased-line rate of the modem falls back to 4800 bps, a dial backup attempt will be initiated.

OnFlBkTo72 – If the leased-line rate of the modem falls back to 7200 bps, a dial backup attempt will be initiated.

OnFlBkTo96 – If the leased-line rate of the modem falls back to 9600 bps, a dial backup attempt will be initiated.

OnFlBkTo120 – If the leased-line rate of the modem falls back to 12000 bps, a dial backup attempt will be initiated.

OnFlBkTo144 – If the leased-line rate of the modem falls back to 14400 bps, a dial backup attempt will be initiated. This is available only on modems with the V.32*terbo* feature.

OnFlBkTo168 – If the leased-line rate of the modem falls back to 16800 bps, a dial backup attempt will be initiated. This is available only on modems with the V.32*terbo* feature.

AT command equivalent is S36=*n.*

NOTE: Rate Auto-Originate is valid only when Autorate is enabled (S76=0) and when running V.32bis modulation.

* This configuration option is only available if the Sync Leased factory preset template is selected.

Table 8-5
(4 of 5)
Leased Line Configuration Options

***Auto Redial**
Nxt Dir_1 Dirs_1-2 Dirs_1-3 Dirs_1-4 Dirs_1-5 Dirs_1-6 Dirs_1-7 Dirs_1-8 Dirs_1-9 Dirs_1-10

Auto Redial. Works in conjunction with the Bad Lines Auto Originate and Rate Auto Originate options. It allows repeated automatic dial backup attempts by specifying the range of directory locations that can be tried. The modem must be in Originate mode.

Dir_1 – The modem will use only directory location 1 for automatic dial backups.

Dirs_1-2 – The modem will use directory location 2 in the event of call failure using directory location 1.

Dirs_1-3 – The modem will use directory location 3 in the event of call failure using the preceding entries.

- •
- •

Dirs_1-10 – The modem will use directory location 10 in the event of call failure using the preceding entries.

AT command equivalent is S37=*n.*

***AutoDialStandby: Disable**
Nxt Disable 15min 1hr 4hr Test(2min) Adv15min Adv30min Adv1hr AdvTest2min

Automatic Dial Standby. Permits a modem operating on dial lines (regardless of the method of dialing origination) to check the quality of the leased lines periodically and, if they are good, to disconnect from the dial lines and resume operations on the leased lines.

The time interval that the modem uses to check the quality of the leased lines is determined by the configuration option. These intervals are 15 minutes, 1 hour, and 4 hours.

The normal settings cause an interruption of data flow on the dial line while the leased-line connection is checked. The Advanced settings allow data flow to continue without interruption while the leased line is evaluated.
If Advanced settings are used, then both modems must be configured to the same Advanced setting.

The Test(2min) selections are for testing this feature only.

The factory default is Disable.

AT command equivalent is S-register S47=*n.*

***CarrierOn Level: –43dbm**
End –43dbm –26dbm

Carrier On Level. This configuration option controls the carrier detection threshold for leased lines. When the power level of the receive carrier signal drops 2 dBm below this level (either –26 dBm or –43 dBm), LSD turns Off. When the carrier signal is greater than this level, LSD turns ON.

The factory default is –43dbm.

AT command equivalent is S-register S48=*n.*

V29 TrainOnData: Disable
Nxt Disable Enable

This configuration option only appears when Leased-Line Rate is configured for V29.

V.29 Train On Data. When enabled, the modem receiver can train based upon the incoming data or a training sequence from the distant modem. This function is necessary for a remote (tributary) modem in a V.29 multipoint network and is recommended for a control modem as well.

The AT command is S-Register S92 = *n*, where *n* is 0 for Disable and 1 for Enable.

Table 8-5
(5 of 5)
Leased Line Configuration Options

Asymmetric Rate: Enable **Nxt Enable Disable**
Asymmetric Rate. Controls rate symmetry when running V.34 modulation. (This configuration option does not appear unless V.34 modulation is selected.) **Enable** – The modem operates in asymmetric rate mode (the transmit and receive rates can be different) when running V.34 modulation. Asymmetric Rate must be enabled in both modems. **Disable** – The modem operates in symmetric rate mode (the transmit and receive rates are identical) when running V.34 modulation. Either modem can force symmetric mode by disabling Asymmetric Rate. The factory default is Enable. AT command equivalent is S-register S15=*n*.
***FallFwdDelay: Disable** **End Disable 5_mins 15_mins 1_hour**
Fall Forward Delay. Provides an initial delay before leased or dial lines are monitored for fall forward conditions. After the timer expires, monitoring occurs as usual. Possible delay times are 5 minutes, 15 minutes, or 1 hour. The factory default is Disable (no delay). **NOTE:** Fall Forward Delay appears under both the Dial Line configuration options and the Leased Line configuration options, but the same setting is used for both. Changing it in one place effectively changes it in the other. There is no analogous AT command, so this option is not available for modems without a shared or integral DCP.
* This configuration option is only available if the Sync Leased factory preset template is selected.

V.42/MNP/Buffer

V.42/MNP/Buffer configuration options determine the type of error correction and flow control used by the modems and attached DTEs.

Some choices within this group may not appear depending upon how previous configuration options have been selected. If the Async/Sync Mode configuration option is set for synchronous operation (see DTE Interface configuration options group), then the V.42/MNP/Buffer group does not appear on the LCD. Any changes made to configuration options within this group only take effect after a disconnect.

Table 8-6 shows each V.42/MNP/Buffer configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-6
(1 of 8)
V.42/MNP/Buffer Configuration Options

***Err Contrl Mode: V42/MNPorBfr**
Nxt V42/MNPorBfr V42/MNPorDsc MNP_or_Buffr MNP_or_Disc BufferMode DirectMode LAPM_or_Disc LAPM_or_Bufr

Determines the type of error control used by the modem. In most cases, V42/MNPorBfr is the best choice. If V.42bis and MNP are enabled, then the modem uses the following priority for error control negotiation: V.42, MNP 5 and below, and Buffer Mode. Online changes do not take effect until a disconnect occurs.

V.42/MNP or Buffer – Modem attempts to connect in V.42 Error Control mode. If this fails, the modem attempts to connect in MNP mode. If this fails, the modem connects in Buffer mode and continues operation. This is also known as V42/MNP Autoreliable Mode.

V.42/MNP or Disconnect – Modem attempts to connect in V.42 Error Control mode. If this fails, the modem attempts to connect in MNP mode. If this fails, the modem disconnects. This is also known as Reliable mode.

MNP or Buffer – Modem attempts to connect in MNP mode. If this fails, the modem connects in Buffer mode. This is also known as MNP Autoreliable Mode.

MNP or Disconnect – Modem attempts to connect in MNP mode. If this fails, the modem disconnects. This is also known as Reliable mode.

Buffer Mode – Modem does not use error control and allows the DTE rate to differ from the communications line rate. This mode should only be used if the DTE provides its own error control or if errors in data can be tolerated. This setting is also known as Normal mode and is valid even if the remote modem is set for Direct mode.

Direct Mode – Modem connects at a data rate equal to or less than the initial DTE interface rate. (The modem never connects at a data rate greater than the initial DTE rate.) If the modem connects at a data rate lower than the DTE rate, the DTE must then adjust its data rate to equal the modem rate. Ultimately, the modem speed and DTE speed must be the same. Direct mode does not support error control or data buffering. Not all DTE and VF rates are available.

LAPM or Disconnect – Modem attempts to connect in V.42 Link Access Procedure for Modems (LAPM) error control mode. If this fails, the modem disconnects. This setting should be used for cellular connections (at both the mobile and PSTN sides) when it is known that both sides support V.42.

LAPM or Buffer – Modem attempts to connect in V.42 LAPM error control mode. If this fails, the modem connects in Buffer mode and continues operation.

NOTE: The modem must be reconfigured for Direct mode before changing the leased-line modulation if V.42 error control or Buffer mode are enabled with V.32bis on leased lines.

For Async Dial and UNIX Dial, V42/MNPorBfr is the factory default.
For Sync Dial and Sync Leased, DirectMode is the factory default.

AT command equivalent is \N*n*.

* This configuration option is only available if Async/Sync Mode is configured for Async. Refer to the DTE Interface configuration options group for more on Async/Sync Mode.

Table 8-6
(2 of 8)
V.42/MNP/Buffer Configuration Options

Sync Comp Mode: DirectMode **Nxt DirectMode HDLC/SDLC**
This configuration option only appears if Async/Sync Mode is configured for Sync. Synchronous Compression Mode. Enables and disables synchronous data compression. **DirectMode** – Disables the Synchronous Data Compression mode. **HDLC/SDLC** – Enables the Synchronous Data Compression mode The AT command for Sync Comp Mode is #SC*n*.
SDC Negotiation: LAPM_Buffer **Nxt LAPM_Buffer LAPM_Discon**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync, and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Data Compression Negotiation. Determines the type of negotiation used when the modem attempts to connect using SDC. See Table I-1 in Appendix I, *Synchronous Data Compression*. **Link Access Procedure for Modems or Buffer** – The modem attempts to establish an SDC connection. If the remote modem has SDC capability, then the connection is established with SDC active. If the remote synchronous modem does not have SDC capability, then the local connection is made in Buffer mode. **Link Access Procedure for Modems or Disconnect** – The modem attempts to establish an SDC connection. If the remote modem has SDC capability, then the connection is established with SDC active. If the remote modem does not have SDC capability, then no connection occurs and the modem generates a disconnect. The AT command for SDC Negotiation is S28=*n*.
SDC Idle Fill: Flag_Fill **Nxt Flag_Fill Mark_Fill**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync, and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Data Compression Idle Fill. Determines whether the modem uses an HDLC flag or mark to fill the time between DTE frame transfers. **Flag_Fill** – Causes the modem to fill the time between DTE frame transfers with HDLC flags. **Mark_Fill** – Causes the modem to fill the time between DTE frame transfers with marks. The AT command for SDC Idle Fill is S29=*n*.
SDC BitEncoding: NRZ **Nxt NRZ NRZI**
This configuration option only appears when the Async/Sync Mode configuration option is set to Sync, and Sync Comp Mode configuration option is *not* set to DirectMode. Synchronous Data Compression Bit Encoding. Determines the type of bit encoding scheme (NRZ or NRZI) the modem uses when transmitting synchronous DTE data. **NRZ** – Causes the modem to use the standard Non Return to Zero bit encoding scheme. **NRZI** – Causes the modem to use the Non Return to Zero Inverted bit encoding scheme. The AT command for SDC Bit Encoding is S31=*n*.

Table 8-6
(3 of 8)
V.42/MNP/Buffer Configuration Options

SyncDTE CRC: Ignore
Nxt Ignore CRC16

This configuration option only appears when the Async/Sync Mode configuration option is set to Sync, and Sync Comp Mode configuration option is *not* set to DirectMode.

Synchronous DTE CRC. Determines whether the CRC of the DTE frame is transmitted from modem to modem.

Ignore – No assumption is made about the CRC type. The CRC is transmitted along with the other data in the frame.

CRC16 – The CRC is known to be the 16-bit CRC for HDLC frames defined by ITU-T (generator polynomial $x^{16} + x^{12} + x^5 + 1$). It is removed from the DTE frame by the sending modem and added to the DTE frame by the receiving modem.

The AT command for SyncDTE CRC is S32=*n*.

SDC Delay Min: Off
Nxt Off Rx_Clock

This configuration option only appears when the Async/Sync Mode configuration option is set to Sync, and Sync Comp Mode configuration option is *not* set to DirectMode.

Synchronous Data Compression Delay Minimization. Allows the modem to transmit a DTE frame to its DTE in a discontinuous way to minimize the delay introduced by SDC processing.

Off – The modem does not begin transmitting a frame to its DTE until the entire frame has been received.

Rx_Clock – The modem begins to transmit data from a DTE frame to its DTE even if the end of the DTE frame has not yet been received by the modem. The receive clock (circuit 115) is clamped when the beginning of a DTE frame has been transmitted to the DTE and no other data from this DTE frame has been received by the modem. As soon as data from the current DTE frame can be transmitted to the DTE, the receive clock is released. The Rx_Clock option appears only if the Tx Clock Source configuration option is set to Internal.

The AT command for SDC Delay Min is #DM*n*.

Sync Flow Cntrl: None
Nxt None Tx_Clock CTS_SyncDTE

This configuration option only appears when the Async/Sync Mode configuration option is set to Sync, and Sync Comp Mode configuration option is *not* set to DirectMode.

Synchronous Flow Control. Controls the type of synchronous data flow control while using data compression.

None – Modem does not control the flow from the synchronous DTE.

Tx_Clock – The transmit clock (circuit 114) clamps when the modem is unable to accept supplementary data from the DTE. Tx_Clock appears only if the Tx Clock Source configuration option is set to Internal.

CTS_SyncDTE – CTS signal circuit (106) is set to OFF when the modem is unable to accept supplementary data from the DTE.

The AT command for Sync Flow Cntrl is #Q*n.*

Table 8-6
(4 of 8)
V.42/MNP/Buffer Configuration Options

V42bis Compress: Enable
Nxt Enable Disable

This configuration option only appears when Async/Sync Mode is configured for Async.

V.42bis Compression. Enables or disables V.42bis data compression.

Enable – Data compression operates in both the transmit and receive directions. This is the recommended setting for all applications.

Disable – V.42bis data compression is disabled. This is rarely needed because V.42bis data compression does not cause data expansion for compressed data.

The factory default is Enable.

NOTE: This configuration option is only available if Error Control Mode configuration option is set for V42/MNPorBfr or V42/MNPorDsc.

AT command equivalent is ″H*n*.

MNP5 Compress: Enable
Nxt Enable Disable

This configuration option only appears when Async/Sync Mode is configured for Async.

MNP5 Compression. Determines if the modem uses MNP Class 5 data compression. It can be set independently of V.42bis data compression. Online changes do not take effect until a disconnect occurs.

The factory default is Enable.

NOTE: This configuration option is only available if Error Control Mode configuration option is set for V42/MNPorBfr, V42/MNPorDsc, MNP or Buffr, or MNP or Disc.

AT command equivalent is %C*n*.

EC Negotiat Bfr: Disable
Nxt Disable Enable Disab&Switch

This configuration option only appears when Async/Sync Mode is configured for Async.

Error Control Negotiate Buffer. Determines if the answering modem buffers the data that it received from the remote modem during an interval in which the modem attempts to establish a connection using error control. Online changes do not take effect until a disconnect occurs.

Disable – Data is not buffered during the link negotiating (handshaking) sequence.

Enable – Data is buffered while the link is being established. Initialization data is not passed on the DTE during the handshaking sequence.

Disable and Switch – Data is not buffered during the handshaking sequence. However, when the modem receives an error control fallback character, it switches to Buffer mode. (See EC Fallback Char configuration option.)

The factory default is Disable.

AT command equivalent is \C*n*.

Table 8-6
(5 of 8)
V.42/MNP/Buffer Configuration Options

EC Fallbck Char: 013 ASCI

Nxt † 013 ASCI

This configuration option only appears when Async/Sync Mode is configured for Async.

Error Control Fallback Character. This configuration option allows you to enter the ASCII value of the error control fallback character. This provides the remote modem with the ability to end the error control link negotiating (handshaking) sequence by sending this character. The modems will connect in Buffer mode (no error control). Online changes do not take effect until a disconnect occurs.

When the modem receives this fallback character it switches to Buffer mode and transmits an EC fallback character to the DTE. When comparing incoming characters for a match against the EC fallback character, the modem ignores parity.

The factory default is 13 ASCII.

NOTE: This configuration option is only available if EC Negotiate Buffer is configured for Disab&Switch.

AT command equivalent is %A*n*.

Flw Cntl of DTE: CTS_to_DTE

Nxt CTS_to_DTE Disable XON/XOFF

This configuration option only appears when Async/Sync Mode is configured for Async.

Flow Control of DTE. Determines how the modem controls the flow of data from the DTE.

CTS to DTE – Method of flow control in which the modem raises and lowers its CTS interface lead to indicate when the DTE should start and stop sending data.

Disable – The modem cannot control the flow of data from the DTE.

XON/XOFF – Method of flow control in which the modem sends XON and XOFF characters to the DTE to start and stop the flow of data.

The factory default is CTS to DTE.

AT command equivalent is \Q*n*.

Flw Cntl of Mdm: Disable

Nxt Disable XON/XOFF RTS_to_Mdm

This configuration option only appears when Async/Sync Mode is configured for Async.

Flow Control of Modem. Determines how the DTE controls the flow of data from the modem.

Disable – The DTE cannot control the flow of data from the modem.

XON/XOFF – Method of flow control in which the modem starts and stops data flow based upon XON and XOFF characters received from the DTE.

RTS to Modem – Method of flow control in which the modem respectively starts and stops data transmission based upon the ON and Off state of the DTE's RTS signal.

The factory default is Disable.

AT command equivalent is \Q*n*.

Table 8-6
(6 of 8)
V.42/MNP/Buffer Configuration Options

XON/XOFF Psthru: Disable
Nxt Disable Enable

This configuration option only appears when Async/Sync Mode is configured for Async.

XON/XOFF Passthrough. Considers an XON/XOFF character as data and passes it on to the remote modem. In this case, the DTE at one end of the communications link can send flow control characters to the other DTE. This is also known as DTE to DTE flow control.

Disable – Flow control characters are processed but are not passed on to the remote modem.

Enable – Flow control characters are processed and passed on to the remote modem.

The factory default is Disable.

NOTE: This configuration option is only available if the Flow Control configuration option is configured for XON/XOFF.

AT command equivalent is \X*n*.

Mdm/Mdm FlowCtl: Disable
Nxt Disable Enable

This configuration option only appears when Async/Sync Mode is configured for Async.

Modem-to-Modem Flow Control. If a modem's buffers begin to fill due to data it is receiving from the remote modem, but is not passing on to the DTE, it can issue XON/XOFF flow control characters to the remote modem. This only applies if Buffer (nonerror control) mode is selected. If Error Control mode is enabled, flow control between the modems will happen automatically, regardless of the setting of this option.

Disable – Modem does not respond to XON and XOFF characters received over the VF line. Also, the modem will not transmit an XOFF character to the remote end if its receive buffers are full.

Enable – Modem stops transmitting data to the remote modem if it receives an XOFF character over the VF line. An XON character will enable data transmission. Also, the modem will transmit an XOFF character to the remote end if its receive buffers are full. Select this setting if the DTE rate is less than the VF line rate or if the DTE must frequently stop the flow of data to process it.

The factory default is Disable.

NOTE: This configuration option is only available if Flow Control is configured for XON/XOFF.

AT command equivalent is \G*n*.

Break Buffr Ctl: Keep Data
Nxt Keep-Data Discard Data Discard Brk

This configuration option only appears when Async/Sync Mode is configured for Async.

Break Buffer Control. Determines if data stored in the modem's buffer is saved or discarded when the DTE issues a break sequence.

Keep Data (Nondestructive mode) – Saves the data in the buffer in both the local and remote modems.

Discard Data (Destructive mode) – Empties the data buffer. Buffers in the same direction of travel as the break are discarded.

Discard Brk – When a break is received from the DTE it is ignored by the modem and not sent acrosss the link.

The factory default is Keep Data.

NOTE: This configuration option is ignored if the Break Forces Escape configuration option (see DTE Dialer configuration options group) is enabled.

AT command equivalent is \K*n*.

Table 8-6
(7 of 8)
V.42/MNP/Buffer Configuration Options

Send Break Cntl: Data-First
Nxt Data-First Break-First

This configuration option only appears when Async/Sync Mode is configured for Async.

Send Break Control. Determines what is sent from the modem first, data or break if a break sequence is sent from the DTE.

Data First (Nonexpedited) – A break is treated as a data character and is sent in the order it was received. This is also known as Nonexpedited mode.

Break First (Expedited) – A break is sent before the data currently in the buffer. This is also known as Expedited mode.

The factory default is Data First.

NOTE: This configuration option is ignored if the Break Forces Escape configuration option (see DTE Dialer configuration options group) is enabled.

AT command equivalent is \K*n*.

TXBuffDiscDelay: 10sec
Nxt 10sec 60sec Disable

This configuration option only appears when Async/Sync Mode is configured for Async, and Error Control Mode is *not* configured for DirectMode, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

The Transmit Buffer Disconnect Delay is the maximum amount of time the modem can continue to send data in its Transmit Buffer to the remote modem after it is commanded by the DTE to disconnect. Disable means that the disconnect occurs immediately. The default is 10 seconds.

Disable – Modem disconnects immediately without attempting to send data stored in its buffers.

10, 60 sec – Maximum amount of time the modem tries to empty its buffers before disconnecting. In both cases (10 sec and 60 sec), the modem disconnects much sooner if it can empty its buffers.

NOTE: This configuration option is not available if Error Control Mode configuration option is set for DirectMode.

AT command equivalent is S-register S49=*n.*

RxBuffDiscDelay: Disable
Nxt 10sec 60sec Disable

This configuration option only appears when Async/Sync Mode is configured for Async, and Error Control Mode is *not* configured for DirectMode, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

Receive Buffer Disconnect Delay. Determines the maximum amount of time the modem can continue to send data in its Receive Buffer to the DTE after the modem is commanded by the DTE to disconnect, or after the modem detects a line disconnect. Through the DCP the available settings are Disable, 10sec, and 60sec; Disable means that the disconnect occurs immediately. The default is Disable.

Disable – Modem disconnects immediately without attempting to send data stored in its buffers.

10, 60 sec – Maximum amount of time the modem tries to empty its buffers before disconnecting. In both cases (10 sec and 60 sec), the modem disconnects much sooner if it can empty its buffers.

NOTE: This configuration option is not available if Error Control Mode configuration option is set for DirectMode.

AT command equivalent is S-register S39=*n*.

Table 8-6
(8 of 8)
V.42/MNP/Buffer Configuration Options

Max Frame Size: 256
Nxt 256 192 128 64 32 16

This configuration option only appears when Async/Sync Mode is configured for Async, and Error Control Mode is *not* configured for BufferMode or DirectMode, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

For cellular applications, at least one of the modems should be set to 32.

AT command equivalent is \A*n*.

CellularEnhance: Disable
Nxt Disable Enable

This configuration option only appears when ETC is installed, Async/Sync Mode is configured for Async and Error Control Mode is configured for V42/MNPorBfr, V42MNPorDsc, LAPM_or_Disc, or LAPM_or_Bfr, or when Async/Sync Mode is configured for Sync and Sync Comp Mode is *not* configured for DirectMode.

Enables or disables V.42 Cellular Enhancement mode.

Disable – The modem uses standard techniques for V.42 operation.

Enable – Cellular enhancements are enabled. The modem is still compatible with modems that do not have cellular enhancements installed or enabled.

AT command equivalent is S91=*n*.

BfrSizInBfrMode: Normal
End Normal Minimized

This configuration option is not displayed for synchronous operation in Direct Mode.

Buffer Size In Buffer Mode. Limits the amount of data buffered during Buffer Mode operation.

Normal – The modem buffers data as usual in Buffer Mode.

Minimized – A minimal amount of data is buffered in Buffer Mode.

The factory default is Normal.

The AT command equivalent is S33=*n*.

Test

The Test configuration options determine specifics, such as the duration of a test, for the various diagnostic tests available to the modem.

Table 8-7 shows each Test configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-7
(1 of 2)
Test Configuration Options

DTE RL (CT140): Disable **Nxt Disable Enable**
DTE Remote Loopback. Controls the use of Pin 21 of the RS-232D/ITU-T V.24 interface by the DTE to initiate a remote loopback. An Abort command or test time-out ends this test. **Enable** – The DTE forces the modem into remote loopback when the signal on Pin 21 (ITU-T 140) is turned ON. Remote Loop ends when the signal is dropped. **Disable** – The DTE does not initiate remote loopback in response to the signal on Pin 21. The factory default is Disable. AT command equivalent is S-register S51=*n*.
DTE LL (CT141): Disable **Nxt Disable Enable**
DTE Local Loopback. Controls the use of Pin 18 of the RS-232D/ITU-T V.24 interface by the DTE to initiate a local loopback. An Abort command or test time-out ends this test. **Enable** – The DTE forces the modem into local loopback when the signal on Pin 18 (ITU-T 141) is turned ON. Local loopback ends when the signal is dropped. **Disable** – The DTE will not initiate local loopback in response to the signal on Pin 18. The factory default is Disable. AT command equivalent is S-register S52=*n*.
Test Timeout: Disable **Nxt Disable 30sec 60sec 240sec**
Test Time-out. Determines how long a test runs before aborting. **Disable** – Allows a test to run indefinitely. **30, 60, or 240 seconds** – Allows the test to run for 30 seconds, 60 seconds, or 240 seconds. The factory default is Disable. AT command equivalent is S-register S18=*n*.
Rcv Remote Loop: Enable **Nxt Enable Disable**
Receive Remote Loopback Response. Determines if the modem responds to a request for a remote loopback issued from a remote modem. The factory default is Enable. AT command equivalent is &T*n*.

Table 8-7
(2 of 2)
Test Configuration Options

V54 Address: Disable **Nxt Disable (Address Values)**
V.54 Address. Determines which remote 3800*Plus* modem is placed into a remote loopback test. This can be either a remote digital loopback or local analog loopback. This type of addressing can be used for extended data circuits (tail circuits). **Disable** – This is used for normal point-to-point dial and leased-line networks. **Address Values** – 01, 03, 05, 07, 09, 0B, 0D, 0F, 11, 13, 15, 17, 19, 1B, 1D, 1F, 25, 27, 2B, 2D, 2F, 33, 35, 37, 3B, 3D, 3F, 55, 57, 5B, 5F, 6F, 77, or 7F. This configuration option selects the address of a modem that is to be placed into a loopback test. This configuration option is used for more complex networks where multiple modems, used in extended data circuits (tail circuits), can be commanded to loopback. **CAUTION:** Selecting an address will disable any remote loopback that can be commanded from a remote modem. The DTE must now control loopback via CT140 and supply the address. The factory default is Disable. AT command equivalent is S53=*n*.
V54 Device Type: Peripheral **End Peripheral Intermediate**
V.54 Device Type. Identifies where the modem is physically located in the network. **Peripheral** – The modem is located at the endpoint of the network and is not connected back-to-back with another modem. **Intermediate** – The modem is either of the two modems connected back-to-back. **NOTE:** This configuration option is only available if V54 Address is enabled. The factory default is Peripheral. AT command equivalent is S54=*n*.

Misc

The Miscellaneous configuration options determine specifics for various functions, including network management parameters and remote modem access.

Table 8-8 shows each Misc (Miscellaneous) configuration option as it appears on the LCD, with the Async Dial factory default setting (the default value if the modem is just being installed) shown following the colon (:) on the first line and with all available selections listed on the second line. Following this is a description of the configuration option, a description of the available selections, and any equivalent AT commands.

Table 8-8
(1 of 3)
Miscellaneous Configuration Options

StrapsWhenDisc: No_Change
Nxt No_Change Reload RelodNoATChg

Straps When Disconnected. Determines whether or not configuration options in the Active (Saved) configuration area are reloaded to Active (Operating) when a disconnect occurs. This is useful in modem pooling applications.

No Change – Configuration options do not change upon disconnect.

Reload – The Active (Operating) configuration area, which controls modem operation, is reloaded from the Active (Saved) configuration area when a disconnect occurs. This is useful in modem pooling applications where it is desirable to start the modem from a known condition after every call. This allows multiple users to issue AT commands to change the modem's operation for their particular call.

Reload, No AT Change – This has the same effect as Reload, except that it becomes impossible to change this configuration option with an AT command, and the command buffer is cleared so that /A (Repeat Last Command) has no effect.

NOTE: If Reload or RelodNoATChg is selected, the following AT commands are disabled although the OK result code appears when these commands are issued:

AT&F0. Loads Async Dial into Active(Operating)
AT&F1. Loads Sync Dial into Active (Operating)
AT&F2. Loads Sync Leased (Answer) into Active (Operating)
AT&F3. Loads UNIX Dial into Active(Operating)
AT&F4. Loads Sync Leased (Originate) into Active (Operating)
AT&F5. If ETC is installed, loads Cellular(Mobile) into Active (Operating)
AT&F6. If ETC is installed, loads Cellular (PSTN) into Active (Operating)
AT&W0. Write Active(Operating) to Active(Saved)
AT&W1. Write Active(Operating) to Customer 1
AT&W2. Write Active(Operating) to Customer 2
AT&Zn=*x.* Store directory numbers

Factory default templates do not affect the setting of StrapsWhenDisc.

AT command equivalent is S88=*n.*

Speaker Control: OnUntilCarr
Nxt OnUntilCarr Off On

Speaker Control. Determines if the speaker is **Off**, **On** until carrier signal is received by the modem, or **On** all the time.

The factory default is OnUntilCarr.

NOTE: Speaker Control can also be temporarily set using the Control branch; however, a reset or power cycle will restore the modem to the Speaker Control and Speaker Volume configuration option settings.

AT command equivalent is M*n.*

Table 8-8
(2 of 3)
Miscellaneous Configuration Options

Speaker Volume: Medium
Nxt Medium Low High

Speaker Volume. Controls the level of speaker volume.

The factory default is Medium.

NOTE: Speaker Volume can also be temporarily set using the Control branch; however, a reset or power cycle will restore the modem to the Speaker Control and Speaker Volume configuration option settings.

AT command equivalent is L*n*.

Access frm Remt: Enable
Nxt Enable Disable

Access from Remote. Determines if your modem's DCP can be accessed by a remote modem via the VF line.

If this configuration option is disabled, the modem cannot be accessed by another modem, and the Clone to Remote feature is not available.

Enable – Allows access from a remote modem.

Disable – Does not allow access from a remote modem.

The factory default templates do not affect Access from Remote.

NOTE: The remote modem must be a 3800*Plus* modem.

AT command equivalent is S-register S55=*n*.

RemAccssPasswrd: 00000000
Nxt ↑ 00000000

Remote Access Password. Allows the entry of a password for establishing control of a remote modem from the DCP of a local modem. The same password must be used in both the local and remote modem.

NOTE: If the Access from Remote configuration option is set to Disable, the password has no effect.

AT command equivalent is S-registers S56, S57, S58, and S59=*n*.

Dir#1_Callback: Disable
Nxt Disable Enable

Directory location 1 Callback. This configuration option controls whether or not the modem's single number callback function is used.

Disable – Modem does not use the single number callback function.

Enable – Modem answers a call, disconnects, and dials the number stored in directory location 1.

NOTE: This function is disabled if dial access security is enabled.

The factory default is Disable.

AT Command equivalent is S67=*n*.

NetMngmtAddress: 256
Nxt ↑ 256

Network Management Address. Determines the address used when accessing a locally attached modem from the 6700 Series NMS. This configuration option is ignored by remote modems.

Address values range from 001 to 256.

The factory default templates do not affect Network Management Address.

AT command equivalent is S-register S75=*n*.

Table 8-8
(3 of 3)
Miscellaneous Configuration Options

NMS_Call_Msgs: CallCnct&Prg
Nxt CallCnct&Prg Disable CallCnctOnly CallProgOnly

NMS Call Messages. Determines if modem status and/or call summary information is sent to the 6700 Series NMS. The modem can itemize status, such as CallProgress messages, or it can report a summary of activity, such as Call Connect messages, to the NMS.

Call Connect & Progress – Enables both Call Connect and Call Progress information to be reported to the NMS.

Disable – Modem status and call summary information is not sent to the NMS.

Call Connect Only – The modem accumulates call statistics over a period of time and then reports these statistics to the NMS. The NMS uses this data to produce utilization reports.

Call Progress Only – The modem reports detailed modem status information to the NMS. These messages include any events that can display on the LCD.

The factory default templates do not affect NMS Call Messages.

AT command equivalent is S66=*n*.

NMS DTR Alarm: Disable
Nxt Disable Enable

NMS DTR Alarm. Determines whether an NMS DTE alarm report is generated when DTR is off.

Disable – The state of DTR does not cause an alarm condition to be reported.

Enable – A DTE alarm condition is reported to the NMS controller in the Device Health & Status message if DTR is off for more than 10 seconds. The alarm condition is reported as inactive after DTR is on for 3 seconds.

The factory default templates do not affect NMS DTR Alarm.

AT command equivalent is S77=*n*.

NetworkPosition: Tributary
Nxt Tributary Control

Network Position Identification. Each modem must be identified either as a control modem or a tributary modem.

NOTE: This configuration option is only applicable for leased-line network management applications.

For the 3810*Plus*, Tributary is the factory default.

For the 3811*Plus*, Control is the factory default.

AT command equivalent is S74=*n*.

CellulrRJ11Adpt:: Disable
End Disable Enable

This configuration option only appears when ETC is installed.

Cellular RJ11 Adapt. Allows the modem to support an RJ11 connection to a 3-watt phone. It also causes the modem to transmit the ETC 1.1 Calling Tone during call origination.

Disable – No RJ11 support or ETC 1.1 Calling Tone.

Enable – For use when the Cellular(Mobile) factory template is loaded, enables RJ11 support and ETC 1.1 Calling Tone.

AT command equivalent is S93=*n*.

Security Configuration Options

The Security Configuration Options group allows you to view and set dial access security parameters. This group appears only if the dial access security feature has been installed.

Table 8-9 shows each Security configuration option as it appears on the LCD. The factory default value is shown after the colon (:) on the first line; all available selections are listed on the second line. After this, a description of the each selection follows. These configuration options do not have an equivalent AT command.

Table 8-9
(1 of 2)
Security Configuration Options

***EntryWait_Time: 20 sec** **Nxt 20 sec 10 sec 40 sec 60 sec**
Entry Wait Timeout. Determines how long the answering modem waits for the originating modem to enter a VF-side password and DTE-side password. This timer resets for each phase of access security. For example, if a VF-side password and a DTE-side password are required, then the user has 20 seconds per entry to input the correct password. The factory default is 20 seconds.
VF_Prompt_Type: 2nd_DialTone **Nxt 2nd_DialTone Quiet_Answer**
VF Prompt Type. Determines how the answering modem requests a valid password from the originating modem for the valid password. This configuration option is only used for VF-side password entry and is not valid for DTE-side password entry. **NOTE:** This configuration option only appears if the Answer Security Mode configuration option is configured for VF_&_DTE. **2nd Dial Tone** – Once the answering modem is off-hook, it generates a dial tone to the originating modem as a prompt for that modem's VF-side password. (Wait for Second Dial Tone is represented by a W in the dial command string.) **Quiet Answer** – Once the answering modem is off-hook, it does not send an answer tone to the originating modem. The originating modem enters its VF-side password after detecting a ring back signal followed by five seconds of silence. For this to work correctly, the Auto Answer Ring # configuration option in the answering modem must be set to 2 rings or greater. (Wait for Quiet Answer is represented by an @ in the dial command string.) The factory default is 2nd_DialTone.
***#DTE_PW_Tries: 1** **Nxt 1 2 3 4 5**
Number of DTE Password Tries. Determines the number of attempts an originating user has to enter a valid DTE-side password. If the password entered does not match a value in the answering modem's Password Table, then the modem will issue the password prompt again (provided that the number of tries is set to a value greater than 1). This will continue until the correct password is entered by the originating user or the number of tries allowed is met. The factory default is 1.
***DTE_PW_TermChar: 013** **Nxt ↑ 013**
DTE Password Termination Character. Allows you to change the ASCII character used to indicate the end of a password or User ID entered by an originating user. This character can be set to any ASCII value from 0 to 127. The factory default is 13 (ASCII carriage return).
* This configuration option does not appear if the Answer Security Mode configuration option is configured for No Answer Security.

Table 8-9
(2 of 2)
Security Configuration Options

***DTE_PW_BkSpChar: 008**
Nxt † 008

DTE Password Backspace Character. Sets the character that is used to perform a backspace in security mode. This character can be set to any ASCII value from 0 to 127.

The factory default is 08 (ASCII backspace).

Get_User_ID: Disable
Nxt Disable Enable

Get User ID. Determines whether the remote user is prompted for an NMS-defined logon ID once the modems have completed initial handshaking. For consistent operation from the remote user's viewpoint, all modems in a modem group must use the same setting.

Disable – The user is prompted only for a password (if required by the setting of Answer Security Mode or the configuration of the VF-side password).

Enable – The user is prompted for a login ID and then a password (if required by the setting of Answer Security Mode or the configuration of the VF-side password). NMS sends a disconnect command to the local modem if the login ID is invalid.

The factory default is Disable.

NMS_Reporting: 00
Nxt † 00

NMS Reporting. Determines whether and how dial access security events are reported to the NMS controller. The possible values, 00–15, represent a bit map. The bits are normally set using the NMS controller.

The value of NMS_Reporting is not affected by loading a factory default template. The initial value when the modem is shipped is 00.

Answer_Secur: No_Answ_Sec
Nxt No_Answ_Sec DTE_Only VF_&_DTE VF_w/_DTE

Answer Access Security Mode. This configuration option is read-only and cannot be changed from the Configure branch. The setting of this configuration option can only be changed in the Set Answer Sec group found in the Security branch.

The settings of this configuration option determine the type of access security protection provided by the modem. It can be disabled using the No_Answ_Sec setting, or it can be enabled with the DTE_Only, VF_&_DTE, or VF_w/_DTE settings.

Originate_Secur: No_OrigSec
End No_OrigSec Ena_Orig_Sec

Originate Security Mode. This configuration option is read-only and cannot be changed from the Configure branch. The setting of this configuration option can only be changed in the Set Orig Sec group found in the Security branch.

This configuration option enables or disables security protection used for outbound calls when using the AT command autodialer function.

* This configuration option does not appear if the Answer Security Mode configuration option is configured for No Answer Security.

This page intentionally left blank.

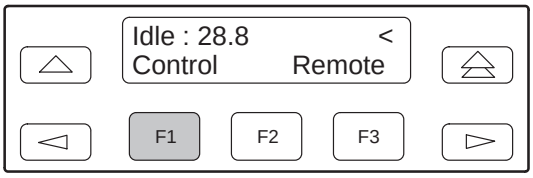
Control Branch 9

Overview

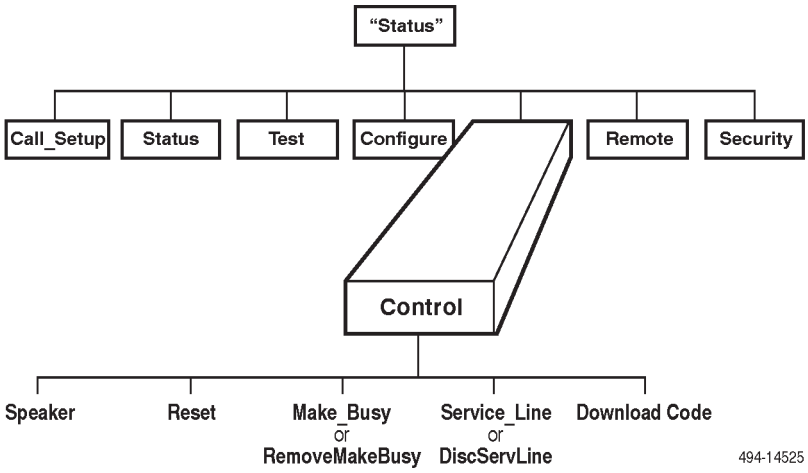
The Control branch of the Top-Level menu allows you to manage hardware and software functions, such as speaker volume, reset, busy out, and firmware download. The 3811*Plus* modem has the additional hardware function, Service Line.

Control Branch

To access Control from the Top-Level menu, make the following selections:



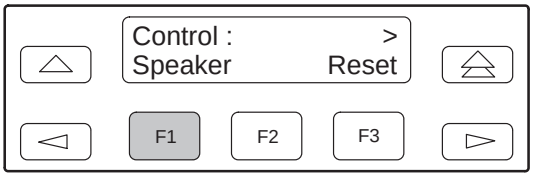
Press the ▻ key until Control appears. Select Control.



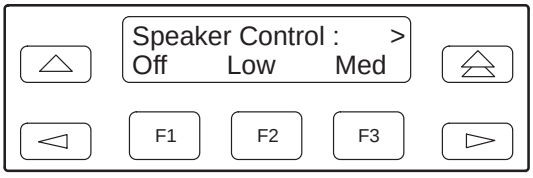
Speaker

Speaker allows you to make temporary adjustments to the modem's speaker volume. Upon a reset, speaker volume returns to its configured setting. For more information on speaker settings, refer to the *Misc* section in Chapter 8, *Configure Branch*.

To access Speaker from the Control branch, make the following selections:



Select Speaker.



Press the ▻ key and appropriate function keys to choose the desired selection.

DCP selections are

Off	Turns the speaker off.
Low	Adjusts speaker to low volume.
Med	Adjusts speaker to medium volume.
High	Adjusts speaker to high volume.

Command Complete appears on the LCD.

To exit Speaker and remain in the Control branch, press the △ key. To exit and return to the Top-Level menu, press the ⏢ key.

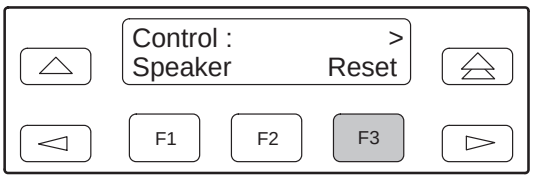
AT Command Equivalent

The AT commands for ON/Off are M0, M1, and M2. The AT commands for volume control are L0, L1, L2, and L3.

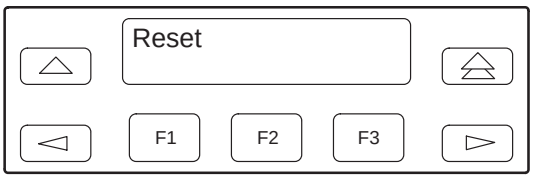
Reset

Reset causes the modem to stop operation and perform a complete program restart. The modem begins the power-up test sequence that ends with the Top-Level menu displayed on the LCD. Configuration options stored in an Active (Saved) configuration area are copied to the Active (Operating) configuration area.

To access Reset from the Control branch, make the following selection:



Select Reset.



Reset appears before the modem performs the power-up diagnostic test sequence.

AT Command Equivalent

The AT command for Reset is Z9.

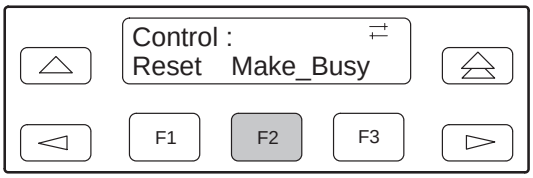
Make Busy/Remove Make Busy

The Make Busy function forces the modem off-hook so it cannot answer a call. This is often used with PBX systems to permit the busy out of a PBX port for rotary or hunt groups.

WARNING

To not violate FCC and DOC regulations, this function must only be used behind a user's PBX.

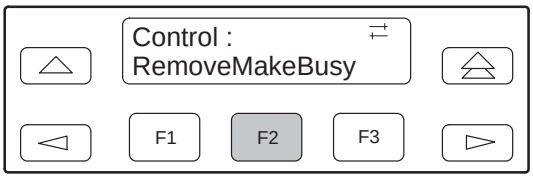
To access Make Busy from the Control branch, make the following selections:



Press the ▷ key until Make Busy appears. Select Make Busy.

The modem is now in a forced busy condition. **Command Complete** appears on the LCD.

To remove the modem from Make Busy mode, press the △ key once and the ▷ key until Remove Make Busy appears.



Press any function key to select RemoveMakeBusy. The message **Command Complete** appears on the LCD.

AT Command Equivalent

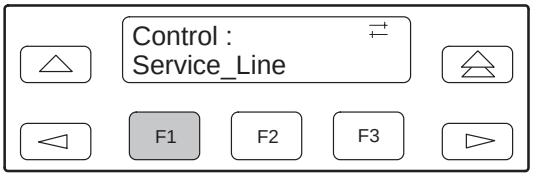
The AT command for Remove Make Busy is H or H0. The AT command for Make Busy is H1.

Service Line/Disconnect Service Line

The Service Line function allows you to switch a specific 3811*Plus* modem installed in a COMSPHERE 3000 Series Carrier from normal dial or leased-line operation to service-line operation. This switch only places the modem on the service line. For a connection to be established, you must still use the normal dialing methods as described in Chapter 5, *Call Setup Branch*.

A service line is an extra dial line connected to a COMSPHERE 3000 Series Carrier. This line is normally shared by up to eight 3811*Plus* modems installed in either Slots 1–8 or Slots 9–16. However, by daisy chaining the service-line connector of one Network Interface Module (NIM) to the service line of another NIM installed in the same carrier, you can permit all 16 modems to share one service line. The service line can also be extended to other carriers in a cabinet. For more information regarding daisy chaining of modems to the service line, refer to the *COMSPHERE 3000 Series Carrier, Installation Manual.*

To enable service line from the Control branch, make the following selections:



Press the ▷ key until Service Line appears. Select Service Line to switch the modem from its normal dial line to the service line. Now, when the modem places a call, instead of using the dial or leased line, the call is placed on the service line.

To disconnect the modem from the service line and resume normal operation, press the △ key once and the ▷ key until Disc Serv Line appears.

Select Disc Serv Line. The call and service line disconnect and the message **Command Complete** appears on the LCD.

AT Command Equivalent

There is no AT Command Equivalent for Service Line.

Download Code

The Download Code function sets parameters within the modem when transferring firmware to a remote modem or when receiving firmware upgrades from a locally attached PC-based controller. The latter should only be performed by customer service personnel.

There are two selections under Download Code: Clone to Remote and To Local via DTE. Clone to Remote is used to transfer an exact copy of the firmware currently stored in a 3800*Plus* modem to another 3800*Plus* modem. For this to occur, the modem must be connected to the remote modem via a leased-line network or an established dial-line network. If these prerequisites do not exist, then this selection does not appear on the LCD.

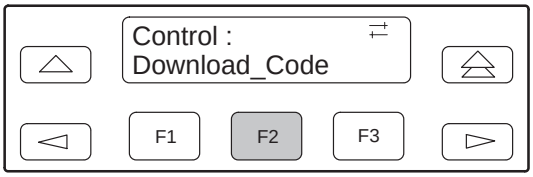
The second selection appearing on the LCD is To Local via DTE. This function permits firmware upgrades to be transferred to a 3800*Plus* modem. This type of download requires a locally attached PC-controller to be connected to the modem's DTE port as well as special download software. **Any downloads using this selection are intended to be performed by customer service personnel only.**

Clone To Remote

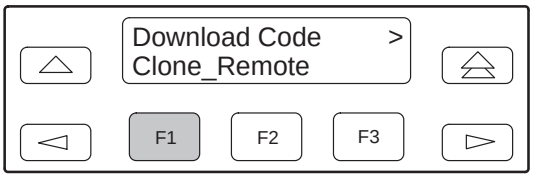
This function allows you to transfer an exact copy of the local modem's firmware to a remote modem. Before using Clone to Remote, perform the following:

- Make sure the modems have an established dial network connection using V.34, V.32*terbo*, V.32bis, or V.32 modulation or a leased-line connection using either V.34, V.32*terbo*, V.32bis, or V.32 modulation.
- Make sure the remote modem's Access From Remote configuration option is enabled.
- Make sure the password (Remote Access Password configuration option) is the same in both the local and remote modems. (For an example of how to change the password, refer to the *Editing and Saving a Configuration Option* section in Chapter 8, *Configure Branch*.)

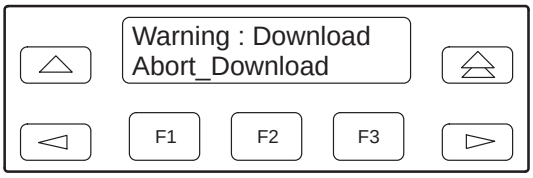
To access Download Code from the Control branch, make the following selections:



Press the ▻ key until Download Code appears. Press any function key to select Download Code.

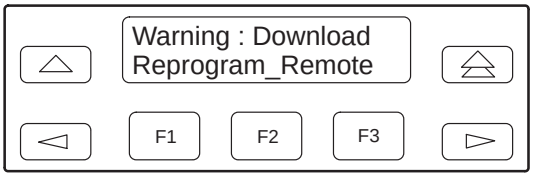


Press any function key to select Clone to Remote.



At this point, if you do not want to continue this process, abort the transfer by selecting any function key. This returns the modem to the Top-Level menu.

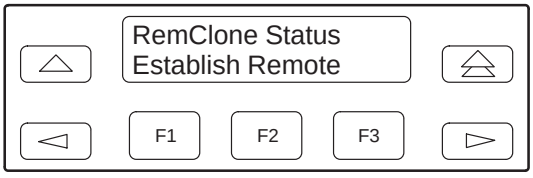
However, to continue with the transfer, press the ▻ key to display the Reprogram Remote selection.



WARNING

Pressing any function key now begins the transfer to the remote modem. This process takes the communications link out of service for several minutes depending upon the data rate of the link (28,800 bps = 5 minutes; 14,400 bps = 10 minutes; 9600 bps = 15 minutes; 4800 bps = 30 minutes). If the Clone to Remote process is started and then interrupted, the remote modem is left in a partially programmed state in which its functional capabilities are limited to those required to initiate and complete another download attempt. If you cannot complete a download, call your service representative.

Press any function key (F1, F2, or F3) to begin the transfer.



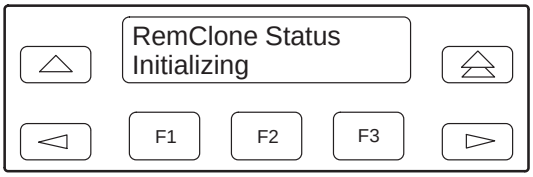
The local modem's LCD displays Establish Remote, indicating the modem is attempting to establish a Remote Cloning Download session with the remote modem.

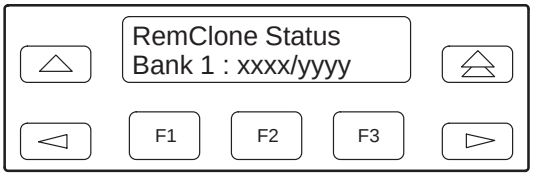
If unsuccessful, the modem remains in the Download Transfer mode. The LCD's top line displays **RemClone Failed** and the bottom line displays one of the following messages:

Incompat Modulat	The modems are connected, but are using a modulation scheme other than V.34, V.33, V.32bis, V.32, or V.29.
No Response	The remote modem is not a 3800*Plus* modem or the connection between the two modems is poor.
Access Disabled	The remote modem's Access from Remote configuration is disabled.
Password Invalid	The local and remote modems' passwords do not match.

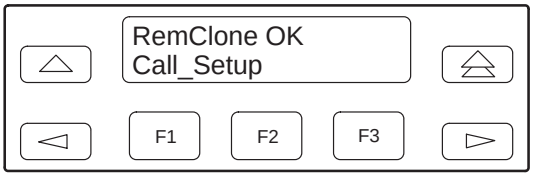
Correct the problem and attempt another download from the local modem. If this fails, contact your service representative.

After successful establishment of a Remote Cloning Download session, the following screens are displayed.





As data banks are transferred, the local and remote LCD's bottom line displays the status of the download process, and the number of records sent versus the total number of records for that bank.



If the download is successful, the local modem displays **Remote Clone OK** and the remote modem displays **Frmware Upgrade**. If the download took place over the dial network, the modems disconnect when the download is complete.

If unsuccessful, **RemClone Failed** is displayed on the LCD's top line. Attempt another download from the local modem. If this fails, contact your service representative.

To Local via DTE

This function is for use only by customer service personnel to transfer new firmware to 3800*Plus* modems.

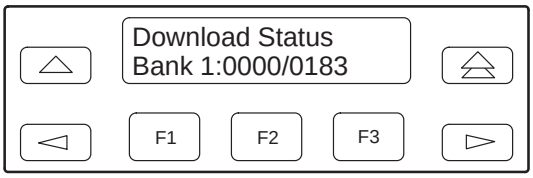
Automatic Firmware Download

New releases may be available for the 3800*Plus* modem. The latest 3800*Plus* firmware is available at no charge from the Automatic Firmware Download Center. Refer to page A in the front of this document for contact information.

To download the firmware, your modem must be configured for dialing. Save your modem's current configuration to the Customer 1 or Customer 2 memory area, and load the Async Dial factory template. (See Chapter 8, *Configure Branch*, for information about saving and changing configuration options.)

If you have a DTE (a terminal or PC) attached to your modem, informational messages are displayed on it when the modem is connected. These show the amount of time the download will take.

However, a DTE is not required. The download begins without any operator action. When the download begins, the DCP displays download status messages with the data bank number, current block being loaded, and the total number of blocks. There are two data banks.

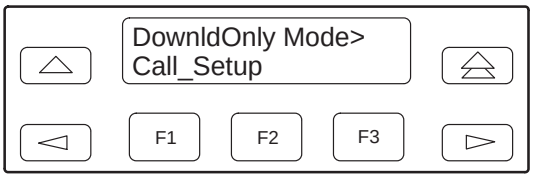


If the modem connects at 14,400 bps, the download takes about 10 minutes. When the download is complete, the modem resets itself and displays a normal status message (such as **Idle:28.8**).

Reload your configuration options from the Customer 1 or Customer 2 memory area that you saved them to.

Download Failure

If the download is interrupted, the modem is left in a state in which it can only be used to make or receive a call for a download.



If an interruption occurs and your modem is left in this state, repeat the download process by directing the modem to dial the Automatic Firmware Download Center. (See Chapter 5, *Call Setup Branch*, for information about dialing a number using the DCP.) If you are unable to complete the download, call your service representative for assistance.

Remote Branch 10

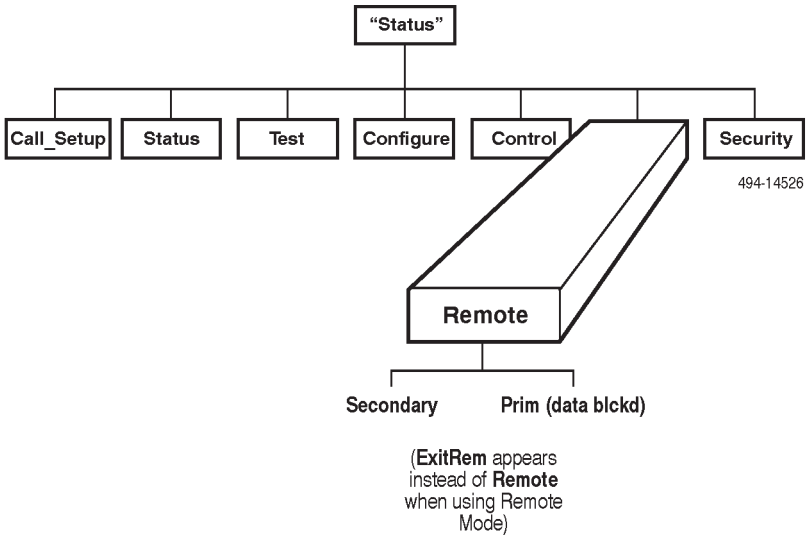
Overview

The Remote branch of the Top-Level menu allows you to control the remote modem's DCP using the local modem's DCP. This allows you to change configuration options and control test functions in a remote modem. Remote DCP access is only available when using V.34, V.32*terbo*, V.32bis, or V.32 modulation schemes.

Remote Branch

The following conditions must be met before using the Remote branch:

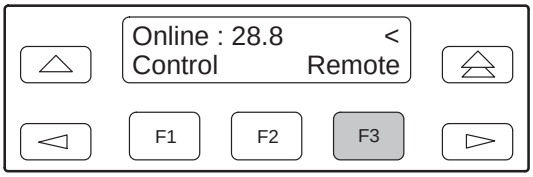
- A connection using either the dial network or leased lines must be established.
- The Access from Remote configuration option must be enabled in the remote modem.
- The Remote Access Password configuration option must be the same for both the local and remote modems.



Remote DCP access is accomplished using either the primary or secondary channel (if available) of the VF line. Using the primary channel gives a much faster response time due to the higher data rate, but it also interrupts data flow because primary data is stopped when Remote mode is active. Once Remote mode is terminated, the primary channel is automatically made available to data transmission.

Unlike primary channel communications, the secondary channel operates at a slower data rate and does not interrupt data flow. (V.34, V.32*terbo*, V.32bis, and V.32 are the only modulations available on the secondary channel.)

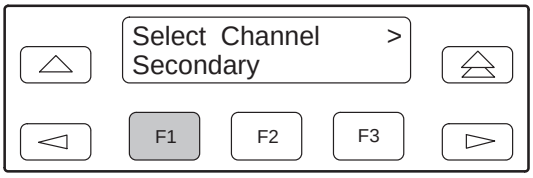
To access the Remote branch, make the following selections:



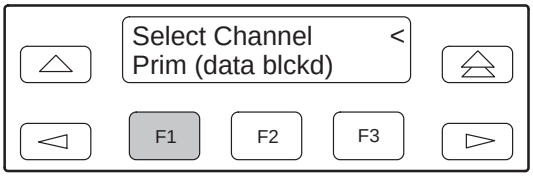
Press the ▻ key until Remote appears. Select Remote.

NOTE

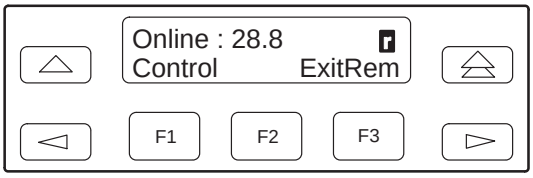
If a connection is not established between a local 3800*Plus* modem and a remote 3800*Plus* modem, the LCD displays **Remote Mode Fail – No Circuit**. Press the ⩓ key to return to the Top Level menu, and dial again.



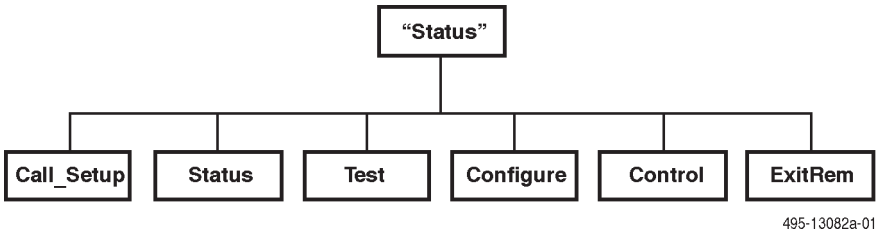
or



If operation over the secondary channel is desired, press any function key to select the secondary channel. **Secondary channel only appears if using V.34, V.32*terbo*, V.32bis, or V.32 modulation.** If operation over the primary channel is desired, press the ▻ key until Prim appears, and press any function key.



If the remote modem accepts the password and the entry is successful, the Top-Level menu of the remote modem appears on the local modem's LCD. An r appears in the upper right-hand corner indicating that what is displayed on your LCD is actually the Top-Level menu of the remote 3800*Plus* modem.



The Top-Level menu of the remote 3800*Plus* modem is similar to the local 3800*Plus* modem with the following exceptions:

- Change Directory is the only function available under the Call Setup branch.
- Self and Local Analog Loop do not appear under the Test branch when using the secondary channel. When using the primary channel, the Test branch does not appear.
- In the Control branch, Make Busy is not available.
- The Security Branch is not available.
- Exit Remote replaces Remote on the local modem's LCD.

To return to local modem operation, select ExitRem. Any changes made to configuration options while using the Remote branch are not saved until you exit the Remote branch.

The following conditions can cause Remote branch access to fail:

- The local modem is not able to communicate with the remote modem because of a poor dial network or leased-line connection, or the remote modem is not a COMSPHERE (3800, 3900, or 3800*Plus* series) modem. If this is the case, the status message **No Response** appears on the LCD.
- If a connection is established but the remote modem's Access from Remote configuration option is disabled, then the status message **Access Disabled** appears on the LCD.
- If a connection is established but the wrong password is stored, the status message **Password Invalid** appears on the LCD. This configuration option must be enabled by the remote user. (See Remote Access Password configuration option in the *Misc* section of Chapter 8, *Configure Branch*.)

This page intentionally left blank.

Security 11

Overview

> **NOTE**
>
> This chapter supports the operation of dial access security for COMSPHERE 3800*Plus* modems. This chapter is self-supporting and can be removed to prevent unwanted knowledge of dial access security operation.
>
> Although the security functions described in this chapter are designed to prevent unwanted user access to your network, the company recognizes that no security system is infallible.

Dial Access Security is an optional feature that allows you to control who has access to your 3800*Plus* modem and ultimately your host DTE.

To take advantage of this security feature, you must create a database of passwords which are stored in the modem's nonvolatile memory. The 3800*Plus* modems can store a maximum of 20 passwords. (A 3811*Plus* with the optional Password Expansion Feature can store up to 3000 passwords.) Each password is assigned a series of parameters that determine the type of security protocol applied to it. This protocol is established in the Security branch of the Top-Level menu. Control of security functions is established in the Security Configuration Options group which is located in the Configure branch of the Top-Level menu. These areas are described in the *Security Branch* section of this chapter and the *Security Configuration Options* section of Chapter 8, *Configure Branch*.

The 3800*Plus* modem uses an outbound and inbound method of security known respectively as Originate Access and Answer Access security. Both methods of security require some type of password entry whether it be included as part of an AT command dial string or entered directly from a remote user's DTE.

Originate Access Security

Originate Access lets you control who can originate a call from a local modem via the AT command set. This is useful in LAN and modem pooling applications. With Originate Access security, a local user's password is embedded in the AT dial command. If the password is valid, the user can dial out using this modem.

The following example illustrates the format for an Originate Access password:

ATD%abc123%T9,8005551234 (press Enter)

Where: **ATD** is the AT dial command string.

% (percent sign) is the start and stop AT command string interrupt character. The password must be embedded in these characters.

abc123 is the 10-alphanumeric character originate password.

T is the Tone (DTMF) dial modifier.

, (comma) is the pause dial modifier.

98005551234 is the phone number.

Originate Access Security is enabled or disabled by the Set Originate Security group.

Answer Access Security

The other method of security, which is the primary focus of this chapter, is Answer Access. Answer Access allows the answering modem to restrict entry to the host DTE by ensuring that originating (remote) modems and/or users have been granted proper security access. Access can be granted by using one of three techniques: VF-side password entry, DTE-side password entry, or a combination of both.

VF-Side Passwords

VF-side password entry occurs between modems prior to connecting. Once the VF-side password is entered, no other user intervention is required since security negotiation is handled solely by the modems. When the answering modem is configured for VF entry technique, it goes off-hook and transmits to the originating modem either a secondary dial tone or silence (this choice depends on how the VF Prompt Type option is configured). The originating modem detects this response and transmits its password which corresponds to a preselected series of DTMF tones. Note that VF passwords can be from 1 to 8 digits in length; only decimal digits are permitted. The answering modem verifies the password against its own password database, and if valid, continues with the normal training sequence.

VF-side password works with any autodialer that supports second dial tone or quiet answer and can be implemented in one of three ways. First, the VF password can be embedded within the AT command dial string. Second, a phone number and password can be entered via the diagnostic control panel (DCP). (This is the preferred method for synchronous applications.) And finally, an attached telephone can be used to manually generate DTMF tones for the phone number and password. After the answering modem accepts the password and generates an answerback tone, the originating caller places the modem in Data mode and hangs up the phone.

The following examples illustrate two ways to enter a VF-side password:

ATDP5551234TW12345678# (press Enter)

or

ATDT5551234@12345678# (press Enter)

Where: **ATD** is the AT dial command.

P and **T** are the Pulse dial and Tone (DTMF) dial modifiers.

5551234 is the phone number.

W or **@** is the VF Prompt Tone option setting for second dial tone or quiet answer.

12345678 is the VF-side password.

is the password termination character.

NOTE

While pulse dial can be used to originate the call, DTMF tones must be used for the password. This can be accomplished by using the P and T modifiers appropriately. Refer to the Dial command in Chapter 13, *AT Command Set and S-Registers*, for more on modifiers.

This method of password entry requires that the answering modem be a 3800*Plus* modem. The modem must be configured for VF-side password entry and the originating user must know the correct VF-side password. The originating modem can be another 3800*Plus* modem or any vendor's modem.

Some originating modems may not recognize the W modifier as a wait for second dial tone. If your call disconnects due to a VF Password Timeout or an Unknown VF Password, first verify that the answering 3800*Plus* modem's VF Prompt Type is set for 2nd Dial Tone. Next, verify that the Dial Tone Detect configuration option in the originating modem is enabled. Third, insert several Pause (,) modifiers into the dial string instead of the W modifier. (For the 3800*Plus* modem, each Pause, which is determined by the Pause Time configuration option (S8), is equal to 2 seconds.) This allows a delay between the processing of the phone number by the answering modem and the transmission of the VF-side password by the originating modem.

Some experimentation may be necessary to determine the number of pauses necessary for your call.

DTE-Side Passwords

DTE-side password entry requires the originating user to supply a valid password via his DTE. This method of password entry occurs after the modems' training sequence, but before normal connection. The modems must be configured for asynchronous operation to use this type of security.

When using DTE-side password entry, the modems go through their normal training and error control negotiation. Once complete, the answering modem requests a valid password from the originating user. The originating user must enter, via the DTE, a password that can consist of digits and case-insensitive letters. Note that DTE passwords can be from 1 to 6 characters in length. The answering modem verifies the password against its password database table, and if valid, completes the data connection, thus allowing DTE data to be passed. As with VF-side password entry, the answering modem must be a 3800*Plus* modem and the originating modem can be either a 3800*Plus* modem or any vendor's modem.

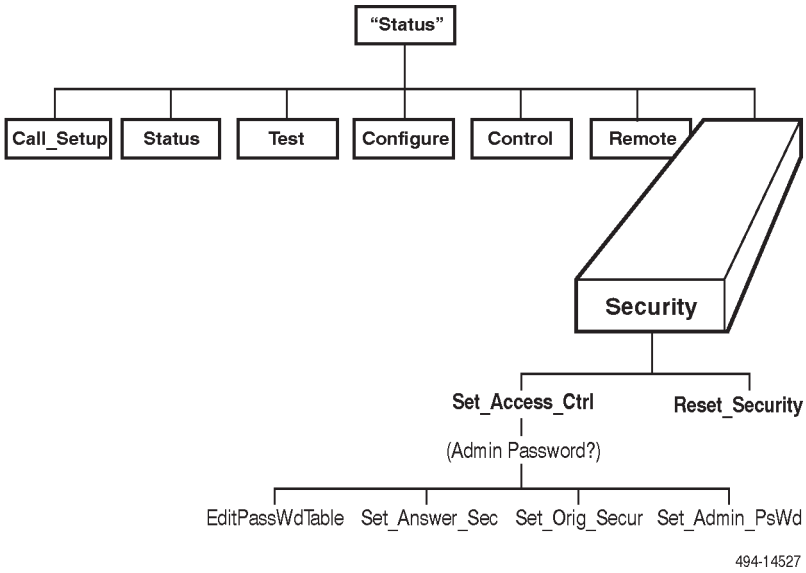
The following example illustrates the format of DTE-side password:

abc123 (press Enter)

Where: **abc123** is a 10-alphanumeric character number. characters used for DTE-side passwords are case insensitive.

Combination of VF-Side and DTE-Side Passwords

The previously described methods of password entry can be combined to provide two layers of security. In this case, the modems negotiate VF-side password entry prior to training. If successful, the modems connect and then prompt the originating user for a valid password. If correctly entered, the modems connect.



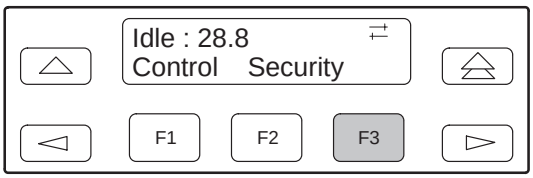
Security Branch

The Security branch of the Top-Level menu allows you to change and save parameters that are critical to the dial access security password database. This database is a collection of passwords and their associated parameters that determine how the modems control password access. Most of the functions within this branch are protected by an Administrative Password. Once the correct password is entered, these security functions appear on the modem's LCD. The two major functions that appear under the Security branch are Set Access Control and Reset Security.

Set Access Ctrl

Set Access Control allows you to change security configuration. This function is protected by an Administrative Password. The Reset Security function allows you to reset the Administrative Password, but results in erasure of the modem's security database.

To access Security from the Top-Level menu, make the following selections:



Press the ▻ key until Security appears. Select Security.

Set Access Control allows you to configure critical parameters contained within the security database table that control dial access security. These parameters are protected by an Administrative Password, which is an 8-digit decimal number.

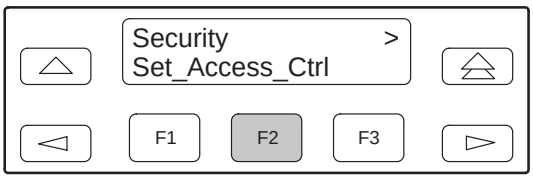
Set Access Control contains the Edit Password Table, Set Answer Security, Set Originate Security, and Set Administrative Password security configuration groups. These groups do not appear on the LCD until the correct Administrative Password is entered.

Administrative Password

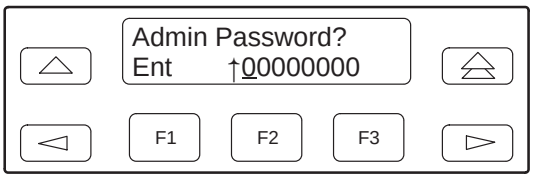
The Administrative Password is an 8-digit decimal number password that allows only authorized users to access Security branch functionality. This password must be entered every time you access the Security branch. This feature is shipped from the factory with the Administrative Password set to 00000000.

Once the correct Administrative Password is entered, the Edit Password Table, Set Answer Security, Set Originate Security, and Set Administrative Password groups can be displayed on the LCD.

To enter your Administrative Password from Set_Access_Ctrl, make the following selections:



Select Set_Access_Ctrl from the Security branch.

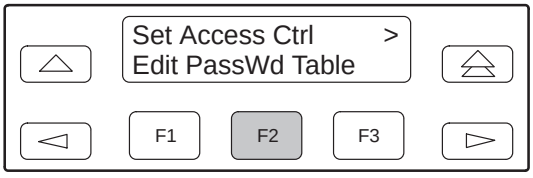


The Administrative Password appears. This occurs every time you enter the Security branch.

Select the F2 (↑) key to increment password values.

Press the ▷ key to move the cursor to the next position.

Continue this sequence until the full Administrative Password value appears and then press Ent.



If the correct value is entered, the EditPassWdTable group appears on the LCD.

Press the ▷ key to scroll the Set Answer Security, Set Originate Security, and Set Administrative Password groups into view.

If an incorrect administrative password is entered, then the message **PassWrd Invalid** appears as well as the last password entered. Enter the correct password value or press the △ or ⏫ key to exit the Security branch.

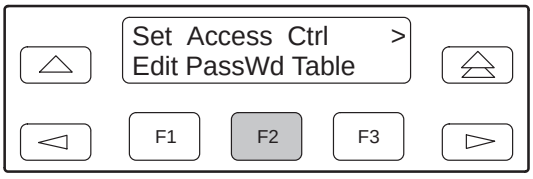
EditPasswdTable

The Password Table is the modem's security database. It contains all essential information for each password stored in the modem's nonvolatile memory. The information associated with each password is known as a record. Records are identified by an index which is a numeric name for a single record. A password's record is retrieved by entering its index.

The Edit Password Table group allows you to view and/or change the modem's security database table. To do this, you must retrieve a password's records by selecting its index. (See *Select Index* section, below.)

The Edit Password Table group consists of the following options: Select Index, Password Type, Edit Password, and Save Edit.

To access EditPasswdTable from Set Access Ctrl, make the following selections:

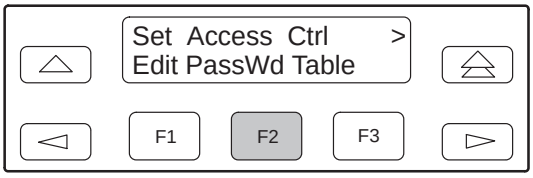


Select EditPassWdTable.

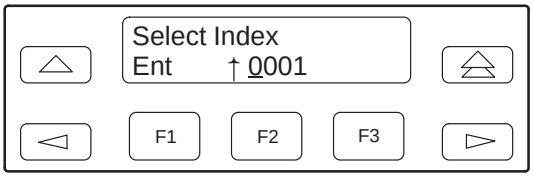
Select Index

Select Index allows a specific record to be retrieved. Index addresses range from 0001 to 0020 for all 3800*Plus* modems and from 0001 to 3000 for a 3811*Plus* with Extended Security. The contents of this record can be viewed, edited, and saved.

To access Select Index, make the following selections:



Select EditPassWdTable.



Select Index appears.

Press the F2 (↑) key to increment index values.

Press the ▻ key to move the cursor to the next position.

Continue this sequence until the desired index appears, and then press Ent.

If an index outside of the range is entered, the message **Index Too Big** appears. Choose an index from the database's current index range.

After selecting an index, the Edit Password Table group's options (Password Type, Edit Password, and Save Edit?) appear in a series of LCD displays.

Keep the following in mind when scrolling down Edit Password Table:

- The current function and index are displayed on the LCD's top line.
- The LCD's bottom line displays Nxt and all selections available for the displayed security option.
- Nxt indicates that more options are available by scrolling down. It also indicates that the value displayed on the LCD is the current setting.
- Use the ◅ and ▻ keys to move selections into view.
- Use the F2 and F3 keys to choose selections.
- If no changes have been made, and the ⏫ key is pressed, the LCD returns to the Top-Level menu.
- If changes have been made, and the △ or ⏫ key is pressed, then Save Edit? appears on the LCD.

Table 11-1 describes the settings of the Edit Table Password group options.

Table 11-1
Edit Password Table Group Options

PsWdType xxxx
Nxt Cleared DTE Entry VF_Entry VF_plus_DTE

Password Type. Indicates whether this index location is configured for VF-side password, DTE-side password, or both. Cleared displays for an index location that contains no valid entry. Note that this option only identifies the type of password used. For proper operation, the type of password selected must be consistent with the type of security used. Refer to the Set Answer Security group option found later in this chapter.

xxxx – Indicates the selected index location.

Cleared – Indicates that the index location does not contain any valid selections and is currently unused.

DTE Entry – Indicates that this index's password is configured for DTE-side password entry. Special requirements apply when using DTE passwords if the Set Answer Security option (Answer Security mode) is set to VF_&_DTE or VF_w/_DTE. Refer to the note following VF plus DTE.

VF Entry – Indicates that this index's password is configured for VF-side password entry. This selection requires that the Set Answer Security option (Answer Security mode) be set to VF_&_DTE.

VF plus DTE – Indicates that both layers of password entry are used with this index's password. This location is configured so that the answering modem sends a prompt for the DTE-side password after receiving a valid VF-side password. This setting requires that the Set Answer Security option be set to VF_&_DTE or VF_w/_DTE.

NOTE: If the Set Answer Security option (Answer Security mode) is set to VF_&_DTE or VF_w/_DTE, special requirements apply in order to use passwords with their type set to DTE_Entry. The originating caller must first enter a valid VF password. If the VF password entered is configured in the security database with the type VF_plus_DTE, the user is then required to enter a password configured in the database table with the type DTE_Entry. In the case of VF_w/_DTE mode, the DTE Entry password must immediately follow the VF_plus_DTE password in the password table.

Edit PsWd xxxx
Nxt ↑ yyyyyyyy or zzzzzz

Edit Password. Allows the password associated with this index to be changed.

NOTE: This security option does not appear if the Password Type option is set for Cleared.

xxxx – Indicates the current index location value.

yyyyyyyy – Indicates the current password value for this index. If the Password Type is VF_Entry or VF_plus_DTE, then the password value is an 8-digit decimal number.

zzzzzz – Indicates the current password value for this index. If Password Type is configured for DTE_Entry, then the password value is a 10-character alphanumeric number.

Save Edit? xxxx
Edit Save Yes No

Save Edit. Saves any changes made in the EditPassWdTable group.

xxxx – Indicates the current index field value.

Edit – Returns the LCD to the Password Type option and does not save any changes made to the index or password table.

Save – Saves changes made to the index or Password Table. Once selected, the Select Index screen appears and increments to the next index value.

Yes No – Appears only if changes are made to any of the options within the Password Table and the or key is pressed before reaching the Save Edit? option. After deciding whether or not to save changes, the LCD displays Select Index and increments to the next index value.

Set Answer Sec

Set Answer Security determines if dial access security is enabled or disabled. This method of inbound security is configured in the answering modem. Although this also appears under the Security Configuration Option group, it can only be changed from the Set Answer Sec LCD display in the Security branch.

To access Set_Answer_Sec from Set Access Ctrl, make the following selections:

Press the key until Set_Answer_Sec appears.

Select Set_Answer_Sec.

Table 11-2 describes the settings of the Set Answer Security group option.

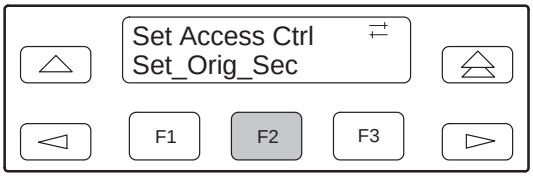
Table 11-2
Set Answer Security Group Options

Set Answer Sec **No_Answ_Sec DTE_Only VF_&_DTE VF_w/_DTE**
Set Answer Security. Is the primary method for enabling or disabling the dial access security function.
No Answer Security – Disables the dial access security feature.
DTE Only – The answering modem is enabled for security. The originating user must supply a password when prompted.
Note that a call attempt never enters data mode if the answering modem is configured for DTE_Only and the originating caller attempts to enter a password using only the VF-side password entry technique.
NOTE: In modem pooling applications where modems are connected to a multiline hunt group (rotary), all modems must have this configuration option set to the same value.
VF_&_DTE – The answering modem is enabled for security. The modems negotiate security using the VF-side password entry technique protocol. If successful, and the Password Type for this particular VF password is set for VF_&_DTE, a password is requested from the originating user. If successful, the modems connect and can pass data.
NOTE: A call attempt fails if the answering modem is configured for VF_&_DTE and the originating caller does not first enter a VF-side password.
VF_w/_DTE – Allows specification of related VF-Side and DTE-side password pairs. In this configuration, a DTE-side password submitted must be a valid Password Table entry, and must match the particular entry associated with the valid VF-side password that was submitted.
The passwords are associated with each other by their index in the Password Table: VF_plus_DTE passwords occupy odd-numbered index locations; their DTE_Entry counterparts occupy the even-numbered index locations that immediately follow. So, for example, if a VF-side password is entered that matches the entry in index location 11, the DTE-side password subsequently entered must match the entry in index location 12.
VF_plus_DTE passwords must be unique in a VF_w/_DTE configuration. An attached DTE in asynchronous operation is required for DTE-side password entry.
Up to 10 password pairs are permitted. On the 3811*Plus* modem this can be optionally increased with the Expanded Password Table feature, which permits 1500 password pairs.

Set Orig Sec

Set Originate Security controls whether or not the modem can originate a call using AT commands when the dial access security feature is installed. This method of outbound security only applies to modems originating a call.

To access Set_Orig_Sec from Set Access Ctrl, make the following selections:



Press the ▻ key until Set_Orig_Sec appears.

Select Set_Orig_Sec.

Table 11-3 describes the settings of the Set Originate Security group option.

Table 11-3
Set Originate Security Group Options

Set Orig Sec **No_OrigSec EnaOrigSec**
Set Originate Security. Controls the security protection for origination of calls when AT commands are used. The originate password must be included in all AT dial command strings if this configuration option is enabled. If not included, or incorrectly entered, the message **ERROR** is returned to the DTE. The Originate Security password must be defined as a DTE_Entry password type. **No Originate Security** – Disables originate security so that a modem can originate a call using AT commands. **Enable Originate Security** – When using AT commands, the modem will only place a call if a valid password is entered along with an AT dial command. If the password is not entered, then **ERROR** is returned to the DTE, and the dial command is canceled.

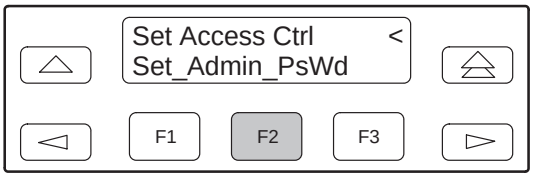
Set Admin PsWd

Set Administrative Password is used to change the Administrative Password value. The Administrative Password is an 8-digit decimal number that allows authorized users to enter the Access Security Control function.

NOTE

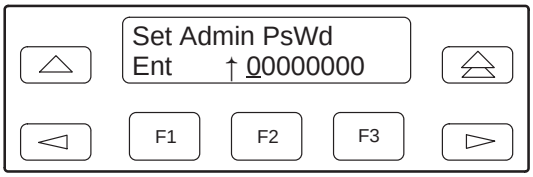
If this value is forgotten, then the only way to access any of the security functions is by selecting Reset Security. This restores the password to a known value*, but erases the contents of the modem's security database.

To change the Administrative Password, make the following selections:



Press ▻ until Set_Admin_PsWd appears.

Select Set_Admin_PsWd.



The Administrative Password appears.

Press the F2 (↑) key to increment password values.

Press the ▻ key to move the cursor to the next position. Continue this sequence until the new password value is entered.

Press the F1 key to save the new password value.

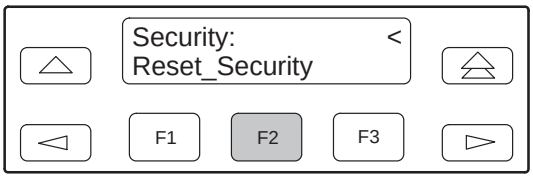
Reset Security

Reset Security is the second major function within the Security branch of the Top-Level menu. It erases all contents of the security database table and resets all index locations to Cleared. Two selections appear under Reset Security: Abort Security Reset and Erase All PassWords. Use Reset Security if you want to redo the entire security database table.

CAUTION

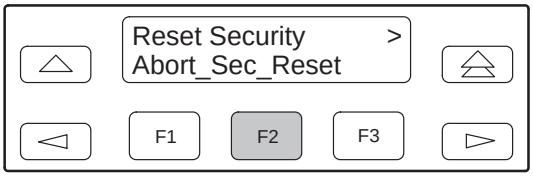
This function can be used as a last resort if the Administrative Password is no longer known. This function causes the Administrative Password to default to the Reset Default password, and erases the contents of the database table.

To reset security, make the following selections:



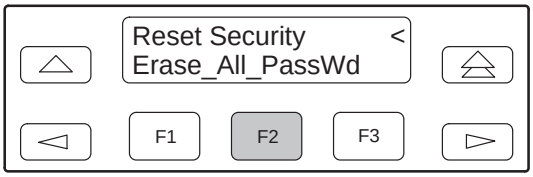
From the Security branch, press ▻ until Reset_Security appears.

Select Reset_Security.



To abort this function, select Abort_Sec_Reset. Nothing is erased and the LCD returns to the main security display.

* This value appears as a single number on the last page of this document.



To reset security, press ▻ until Erase_All_PassWd appears on the LCD.

Select Erase_All_PassWd.

The entire security database is erased and the Administrative Password defaults to the Reset Default password value. This value appears as a single number on the last page of this document.

Security Password Entry Techniques

The previous sections described how to set up and configure your network for dial access security. Once configured and enabled, you must now supply a password to originate or answer a call.

The following examples demonstrate how to enter an Answer Access security password string and an Originate Access password string. Note that dial access security messages, that may appear on the LCD, are listed in Table 4-5 in Chapter 4, *Front Panel Operation*.

Answer Access Password (VF-Side and DTE-Side Entry Techniques)

Answer Access password security uses two password entry techniques: VF-side password and DTE-side password entry. A VF-side password consists of DTMF tones and is entered by the originating caller via the AT command set, the DCP, or manually with an attached telephone.

A VF-side password can be entered with the AT dial command. The following examples illustrate two ways to enter a VF-side password:

ATDT5551234W12345678#

or

ATDP5551234T@12345678#

PRESS: Enter

Where: **ATD** is the AT dial command.

P and **T** are Pulse dial and Tone (DTMF) dial modifiers.

5551234 is the phone number.

W is the second dial tone dial modifiers.

@ is the wait for quiet answer dial modifiers.

12345678 is the password. VF-side passwords must consist of 1–8 decimal digits.

is the password terminator character.

> **NOTE**
>
> While pulse dial can be used to originate the call, DTMF tones must be used for the password. This can be accomplished by using the P and T modifiers appropriately. Refer to the Dial command in Chapter 13, *AT Command Set and S-Registers*, for more information about modifiers.

Some originating modems may not recognize the W modifier as a wait for second dial tone. If your call disconnects due to a VF Password Timeout or an Unknown VF Password, first verify that the answering 3800*Plus* modem's VF Prompt Type is set for 2nd Dial Tone. Next, verify that the Dial Tone Detect configuration option in the originating modem is enabled. Third, insert several Pause (,) modifiers into the dial string instead of the W modifier. (For the 3800*Plus* modem, each Pause, which is determined by the Pause Time configuration option (S8), is equal to 2 seconds.) This allows a delay between the processing of the phone number by the answering modem and the transmission of the VF-side password by the originating modem.

Some experimentation may be necessary to determine the number of pauses necessary for your call.

A DTE-side password is entered after the modems have trained, but before a normal connection is established. The following example illustrates how to enter a DTE-side password:

TYPE: **abc123**

PRESS: Enter

Where: **abc123** is a 10-alphanumeric character password. characters used for DTE-side passwords are case-insensitive. DTE-side passwords can be from 1 to 6 characters in length.

If a valid password is entered, then the modems connect and data can pass.

Originate Access Password

An Originate Access password is entered by a local user to gain access to a local 3800*Plus* modem. This password is embedded in the AT dial command and cannot be entered from the diagnostic control panel (DCP). The password must be defined as a DTE_Entry type in the password table.

The following example describes how to enter an Originate Access security password:

TYPE: **ATD%abc123%T9,8005551234**

PRESS: Enter

Where: **ATD** is the AT dial command.

% is the start and stop dial string command interrupt characters; the Originate Access password must be enclosed by these characters.

abc123 is the 10-alphanumeric character Originate Access password.

T is the Tone (DTMF) dial modifier.

Comma (**,**) is a pause dial parameter.

98005551234 is the phone number.

Database Table Examples

The following examples illustrate possible database tables in which the password type is configured for VF Entry, DTE Entry or a combination of VF, DTE, and VF plus DTE Entry. These tables are shown for illustrative purposes only. Passwords shown are not representative of good password selections.

NOTE

The **Assigned to** column is not stored in the modem.

Table 11-4 is an example of a database table with passwords configured for VF Entry only. This type of password is entered within the AT command dial string.

Table 11-4
Security Database Table
Using VF-Side Passwords

VF Password Only			
Index	**Password**	**Type**	**Assigned to**
21	1	VF_Entry	Denver office
31	12	VF_Entry	Chicago office
41	1212	VF_Entry	Dallas office
51	953246	VF_Entry	Miami office, modem 1
52	46958373	VF_Entry	Miami office, modem 2
61	32562682	VF_Entry	Atlanta office

Table 11-5 is an example of a database table with passwords configured for DTE Entry only. This type of password is entered via the originating user's DTE.

Table 11-5
Security Database Table
Using DTE-Side Password

DTE Password Only			
Index	**Password**	**Type**	**Assigned to**
1001	winter	DTE_Entry	User A
1002	summer	DTE_Entry	User B
1003	spring	DTE_Entry	User C
1004	fall	DTE_Entry	User D
1005	z	DTE_Entry	User E
1006	3g8sX4	DTE_Entry	User F

Table 11-6 is an example of a security database table that uses a mixture of VF and DTE passwords.

Table 11-6
Security Database Table Using
Both VF-Side and DTE-Side Password

VF and DTE Passwords			
Index	**Password**	**Type**	**Assigned to**
121	1	VF_Entry	Denver office*
131	12	VF_plus_DTE	Chicago office**
141	1212	VF_plus_DTE	Dallas office**
151	953246	VF_plus_DTE	Miami office, modem 1**
152	46958373	VF_plus_DTE	Miami office, modem 2**
161	32562682	VF_Entry	Atlanta office*
1131	winter	DTE_Entry	User C, Chicago office**
1141	summer	DTE_Entry	User A, Dallas office**
1142	spring	DTE_Entry	User B, Dallas office**
1151	fall	DTE_Entry	User D, Miami office**
1152	z	DTE_Entry	User E, Miami office**
1153	3g8sX4	DTE_Entry	User F, Miami office**

* Users in the Denver and Atlanta offices are connected to the DTE after entering a valid VF password (and the modems train and negotiate error control) without entering a DTE password.

** Users at the Chicago, Dallas, and Miami offices are required to enter a DTE password after the VF password is entered via the AT dial command.

Table 11-7 is an example of a security database table that uses paired VF and DTE passwords for use in VF_w/_DTE answer security mode.

Table 11-7
Security Database Table Using Paired VF-Side and DTE-Side Passwords

VF and DTE Passwords			
Index	**Password**	**Type**	**Assigned to**
02	user1	DTE_Entry	User A Logon ID*
03	00110002	VF_plus_DTE	User B, Denver office
04	ralph	DTE_Entry	User B Logon ID*
05	4695873	VF_plus_DTE	Berlin office
06	guest	DTE_Entry	Guest Logon ID*
07	4695873	VF_plus_DTE	Berlin office
08	actmgr	DTE_Entry	Account Manager Logon ID*
09	350647	VF_plus_DTE	User C
10	miami	DTE_Entry	Miami office*
11	00159766	VF_plus_DTE	User D
12	miami	DTE_Entry	Miami office*

* For this password to be valid, the VF_plus_DTE password entered must be the one immediately preceding the DTE_Entry password in the table.

Fax Operation 12

Overview

The procedures for sending and receiving facsimile documents with your modem depend on the fax software you use. This chapter does not contain specific procedures, but rather information that may make it easier for you to use the documentation that came with your fax software.

Fax Operation

Your modem, in combination with your computer and fax software, is capable of emulating the functions of a fax machine. You can use it to send and receive fax files in communication with another fax modem, or with a standard fax machine. These fax files are images turned into the sort of data that can be stored in your computer.

Fax machines and fax modems use special protocols different from those used by standard modems. The device you intend to communicate with must be compatible with your modem, which means that it must be capable of using the same protocol. Your 3800*Plus* modem supports Class 1 (EIA 578) and Class 2 (EIA/TIA SP-2388) Group III fax, using V.17, V.29, or V.27ter modulations.

Before you can send or receive a fax, the following must be true:

- You must have fax software installed on your computer.
- Your modem must be online with a compatible fax modem or fax machine.
- You must have configured your modem according to the specifications of your fax software manual. For example:
  - — Some fax software requires that the modem have Auto-Answer disabled. You can set this using the AutoAnswerRing# configuration option under the Line Dialer branch, or by issuing the ATS0=0 command.
  - — Some fax software requires that the modem use software flow control. You can set this using the FlwCntlofDTE and FlwCntlofMdm configuration options under the V.42/MNP/Buffer branch, or by issuing an AT\Q1 command.
  - — DTR Action should be set for standard RS-232D operation. Use the Stndrd_RS232 setting of DTR Action (in the DTE Interface configuration options group), or the AT&D2 command.
  - — LSD (Line Signal Detect) Control should be set for standard RS-232D operation. Use the Stndrd_RS232 setting of LSD Control (in the DTE Interface configuration options group), or the AT&C1 command.
  - — Data should be buffered during Error Control (EC) negotiation. Use the Enable setting of EC Negotiate Bufr (in the V.42/MNP/Buffer configuration options group), or the AT\C1 command.

There are no Diagnostic Control Panel (DCP) functions unique to fax operation. If your fax software requires that you change the configuration of your modem, see the appropriate sections of Chapter 8, *Configure Branch*.

The DCP is disabled during fax operation.

Your fax software uses AT commands to tell the modem what to do. These commands, and the replies your modem makes (such as “OK”) may be displayed on your computer terminal during fax operation, but this depends on your software. You do not have to issue AT commands yourself, unless you use AT commands to configure the modem.

For more information about fax operation, see the manual that came with your fax software.

AT Command Set and S-Registers 13

Overview

The AT command set provides an alternative method to the front panel for entering commands that control the operation and configuration of the 3800*Plus* modems. AT commands are issued from an asynchronous DTE (such as a personal computer). This chapter explains how to use AT commands and lists the modifiers for all AT commands supported by the 3800*Plus* modems.

Operating Modes

The 3800*Plus* modem has two operating modes: Command mode and Data mode. Before a modem goes online (establishes a successful connection with a remote modem), it is considered to be in Command mode, an idle state where you can modify its operating parameters or issue modem commands.

In Command mode, any command issued is acknowledged with a response in either words or digits known as a result code. Refer to Appendix B for a list of result codes.

Once the modems go online, either by answering or originating a call, they automatically switch to Data mode. Data mode is a state where any entries made from the DTE are considered data and are transmitted and received between modems. The modems remain in Data mode until the connection is broken or until they are forced into online Command mode using the escape sequence.

Switching Between Data Mode and Online Command Mode

Sometimes it is necessary to change operating parameters while the modems are online. The escape sequence allows you to toggle the modem between Data mode and online Command mode while maintaining a connection with the remote modem. This is accomplished using the escape sequence (+++) to exit Data mode and the O command to return to Data mode.

Escape Sequence and Escape Guard Time

The escape sequence is only issued when the modem is online and in Data mode. The 3800*Plus* modem uses three consecutive plus (+) characters as the escape sequence. (To change this value, refer to S-register S2 discussed in Table 13-2 in the *S-Register Format* section.)

To prevent the modem from interpreting an embedded +++ in data as an escape sequence, the Escape Guard Time value determines the length of the pause before and after the escape sequence is issued. The 3800*Plus* modem uses a one second pause as the Escape Guard Time. (To change this value, refer to S-Register S12 discussed in Table 13-2 in the *S-Register Format* section.)

To enter online Command mode while in Data mode, enter the following sequence:

TYPE: +++

Use the O command to return to Data mode from online Command mode. Enter the following command:

TYPE: ATO

PRESS: Enter

Command Guidelines

Review the following guidelines before using any AT Commands.

- The escape sequence (+++) is used to enter online Command mode from Data mode.
- The asynchronous character format for the AT command set must be one of the following:
  - — 8 data bits + no parity + 1 stop bit.
  - — 7 data bits + no parity + 2 stop bits.
  - — 7 data bits + parity + 1 stop bit (parity can be odd, even, mark, or space).

- All commands (except A/ (repeat last command) and +++) must begin with the characters AT and end by pressing the Enter key. The AT (or at) prefix clears the command buffer and matches the modem speed and parity to that of the DTE. Commands can be upper- or lowercase, but the modem will not recognize mixed case prefixes (At or aT).
- Commands can be entered one at a time or in strings. Strings can have up to 40 characters after the AT prefix. You can use spaces, hyphens (–), and parentheses ( ) as fillers to make the commands easier to read; the modem ignores these fillers and they are not counted among the characters which make up the command string. Commands must be entered on one line and end with the carriage return character (Enter key).
- Commands with the suffix *n* have several options associated with them. For example, in the L*n* command, L1 sets the speaker volume to Low and L3 sets the speaker volume to High. If no value is entered for the *n* suffix, the modem assumes a zero (0) value.
- The A/ command (without pressing the Enter key) causes the modem to repeat the last command entered.
- Valid commands are acknowledged with numeric or word result codes (unless the result codes have been disabled using the Q1 command). Appendix B lists result codes with numeric and word equivalents.

Any-Key Abort

The any-key abort function aborts a call establishment attempt when a character is received from the DTE under the following conditions:

- The AT command set is enabled.
- The modem is in the process of answering or originating a call.

AT Command List

AT commands are issued from an asynchronous DTE, such as a PC, and control the modem's operation and software configuration. AT commands are only applicable when the DTE Dialer Type configuration option is set for AT. (See &Mn and &Qn commands.)

Table 13-1 lists all AT commands supported by the 3800*Plus* modem. The first column lists the AT command. The second column defines and lists all possible values for that command. The Async Dial factory default is listed in **bold**. The third column lists the key sequence used to enter the equivalent front panel command. Use this reference to locate commands in Chapters 4 through 10 if further description is necessary.

AT Command Format

AT commands are entered in Command mode using the following format:

TYPE: AT***X****n*

Where: *X* is the AT command and *n* is the specific value for that command.

PRESS: Enter

In Table 13-1, the value for *X* is listed in the **AT Command** column and the value for *n* is listed in the **Description** column.

Table 13-1
(1 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
A/	**Repeat Last Command** Re-executes last command string. (Not to be preceded with AT or followed by pressing the Return key.)	
A	**Answer Mode** Goes off-hook and attempts to establish a connection without waiting for a ring.	None
B*n*	**ITU-T/Bell Mode** Determines the protocol used if the dial-line rate is set to 300 or 1200 bps. It has no effect if the rate is set to another value. (See %B*n* and %BL*n*.) B, B0 V.21 or V.22 (300 or 1200 bps) **B1** **Bell 103 or Bell 212A** (300 or 1200 bps)	Configure\Edit\ Dial Line

Table 13-1
(2 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
D*n*	**Dial** Begins the dialing sequence. The dial string n (modifiers and telephone number) is entered after the D command. Any digit 0–9, * , # , A, B, C, D, may be dialed as a DTMF tone. Only the digits 0–9 can be dialed in Pulse Dial mode. If any character is received from the DTE before the modem goes online, the dial sequence is aborted. This is known as any-key abort. The following example shows how to dial through a PBX. The dial string consists of the command string and the telephone number: *ATD9W*5551234 Command String / Telephone Number Dial String Modifiers include the following parameters: **T** – Tone (DTMF) dial. Any digit 0–9, * , #, A, B, C, or D can be dialed as tone. **P** – Pulse dial. Only the digits 0–9 can be dialed in Pulse Dial mode. **NOTE:** Once a dialing method (tone or pulse) has been specified, it will only remain active until the end of that dial string. The factory setting is tone dial. **W** or **+** – Wait for dial tone. Modem waits for a second dial tone before processing the dial string. This can be the initial dial tone or a second tone received when dialing through a tandem PBX (for example, 9+555-6789), or when invoking special features (for example, 70#W555-6789, where 70# disables Call Waiting). **R** – Reverse Dial mode. Causes the originating modem to send out an answertone once it no longer detects ringback. (Ringback is the ring you hear at the originating site when making a call.) The R parameter must be the last character in the dial string. For correct operation, at least one ringback must be detected; therefore, the remote modem should be configured to answer on the second ring or subsequent rings. @ – Quiet answer. Wait for five seconds of silence after dialing the number. If the silence is not detected, the modem sends either a NO ANSWER result to the DTE. **!** – Hook flash. This causes the modem to go on-hook for 0.5 seconds then return to off-hook. **,** – Pause. Causes the modem to pause before processing the next character in the dial string. The length of this pause is determined by the setting of the Pause Time configuration option (see Line Dialer configuration option group) or by value held in S-register S8. **;** – Return to Command mode. Modem returns to Command mode after dialing a number without disconnecting the call. This is useful when the number exceeds 40 characters, or when the wait time between parts of a dial string is unknown. This modifier disables the any-key abort function. **Space, –** , and **( )** . These characters are ignored by the dial string and can be included in the dial string to enhance readability.	None

Table 13-1
(3 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
DS=*n*	**Dial Stored Number** Dials the number stored in Location *n* (1–10). (To store a telephone number, refer to the &Z*n*=*x* command.) If any character is received from the DTE before the modem goes online, the dial sequence is aborted. This is known as any-key abort.	Call Setup\Dial\ Dial Directory:
E*n*	**Command Character Echo** E0 Disables echo to the DTE. **E1** Enables echo to the DTE.	Configure\Edit\ DTE Dialer
H*n*	**Hook Switch Control** H0 Modem goes on-hook. H1 Modem goes off-hook.	H0: Call Setup\Disconnect *or* Control\Remove Make Busy H1: Control\ Make Busy
I*n*	**Identification** I0 Displays product code; default is 144. I1 Displays 3-digit firmware revision number. I2 Performs an EPROM check. I3 Displays the modem's serial number. I4 Displays the modem's model number. The model number of a 3810*Plus* begins with 3980. The model number of a 3811*Plus* begins with 3981. I5 Displays the part number of the circuit card. I6 Displays the firmware release number. I9 Displays 3-digit firmware revision number (same as I1). I10=*n* Changes the value of the product code displayed by the I0 command; *n* is a number from 0 to 4: I10=0 sets product code to 144 I10=1 sets product code to 240 I10=2 sets product code to 480 I10=3 sets product code to 960 I10=4 sets product code to 120 I11 Performs a checksum of the modem's firmware and displays the results in hexadecimal. (There is no DCP equivalent of this command.) I19 Displays the entire firmware revision level.	Status\Identity
L*n*	**Speaker Volume** L0 Selects low volume. L1 Selects low volume. **L2** Selects medium volume L3 Selects high volume.	Control\Speaker Configure\Edit\Misc
M*n*	**Speaker On/Off** M0 Speaker always off. **M1** Speaker on until carrier signal is detected. M2 Speaker always on.	Control\Speaker Configure\Edit\Misc
O	**Return to Online or Data Mode** Returns modem to Data mode from Online Command mode.	None

Table 13-1
(4 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
P	**Pulse Dial** Sets the modem for pulse dial mode. See the D*n* command.	Configure\Edit\ Line Dialer
Q*n*	**Result Codes** **Q0** Enables modem to send result codes to the DTE. Q1 Disables modem from sending result codes to the DTE. Q2 Enables in Originate mode only for modem to send result codes to the DTE. Required for most UNIX applications.	Configure\Edit\ DTE Dialer
S*r*=*n*	**Change S-Register** Changes contents of S-register (where *r* is the S-Register, and *n* is the new value). See Table 13-2, 3800*Plus* S-Registers.	None
S*r*?	**Display S-Register** Displays value of S-register where *r* is the S-register number.	None
T	**Tone Dial** Sets the modem for tone dial mode.	Configure\Edit\ Line Dialer
V*n*	**Result Codes Format** V0 Displays result codes in Number (1) format digits. **V1** Displays result codes as text. V2 Displays result codes in Number (2) format (digits).	Configure\Edit\ DTE Dialer

Table 13-1
(5 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
X*n*	**Extended Result Code, Dial Tone Detect, and Busy Tone Detect Configuration Options** X0 Disable / Disable / Disable X1 Enable / Disable / Disable X2 Enable / Enable / Disable X3 Enable / Disable / Enable X4 Enable / Enable / Enable X5 Add/EC / Enable / Enable X6 Add/V42,MNP / Enable / Enable X7 Use DTE Rate / Enable / Enable (*Extended Result Code* / *Dial Tone Detect* / *Busy Tone Detect*) *Extended Result Code* **Enable**. Displays all result codes listed in Appendix B except for error control suffix. Disable. Only displays OK, CONNECT, RING, NO CARRIER, ERROR. Add/EC. Displays result codes with /EC suffix. Add/V42,MNP. Displays result codes with either V.42 or MNP suffix. Use DTE Rate. Displays DTE data rate instead of line rate. Add/V42,MNP. Displays result codes with either V.42 or MNP suffix. Use DTE Rate. Displays DTE data rate instead of line rate. *Dial Tone Detect* **Enable**. Sets the modem for dial tone detect. Disable. Sets the modem for blind dialing. *Busy Tone Detect* **Enable**. Modem monitors for busy tone. Disable. Modem ignores busy tone.	Extended Result Code: Configure\Edit\DTE Dialer Dial Tone Detect: Configure\Edit\ Line Dialer Busy Tone Detect: Configure\Edit\ Line Dialer
Y*n*	**Long Space Disconnect** Y0 Disable. Ignores long space. **Y1** Enable**.** Disconnects if long space is detected. Enables transmission of a long space.	Configure\Edit\ Line Dialer
Z*n*	**Reset and Load Active** Z0 Loads configuration options from Active (Saved) to Active (Operating). Z1 Loads configuration options from Customer 1 to Active (Operating). Z2 Loads configuration from Customer 2 to Active (Operating). Z3 Loads configuration options from Active (Saved) to Active (Operating) and performs a reset (if the modem is connected, it is disconnected). Z9 Performs a full modem reset, as if the power were turned off and on.	Control\Reset

Table 13-1
(6 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
+FCLASS=*n*	**Service Class Selection** Normally set by fax software, Service Class Selection determines the fax protocol. The command is sent to the modem in the format +FCLASS=*n*, where *n* can be set to one of three values: **0**=Data 1=Class 1 Fax (EIA 578) 2=Class 2 Fax (EIA/TIA SP-2388 dated 20 August 1990) In the format +FCLASS?, the +FCLASS command returns the current Service Class: 0, 1, or 2. In the format +FCLASS=?, the +FCLASS command returns the Service Classes available: 0, 1, 2. **NOTE:** Other fax commands supported by the 3800*Plus* modems are not documented in this manual because they are not normally issued by the user. They follow the EIA 578 and EIA/TIA SP-2388 specifications.	None
&C*n*	**LSD Control** &C0 Forced On. LSD on at all times. **&C1** Standard RS232. LSD is on when the remote modem's carrier signal is detected. LSD is off when carrier signal is not detected. &C2 Wink When Disconnect. LSD normally forced ON, turns Off for approximately one second upon disconnecting. &C3 Follows DTR. State of LSD follows state of DTR. &C4 Simulated Control Carrier. State of LSD follows state of remote modem's RTS. &C5 =DTR/Disconnect Off. State of LSD follows state of DTR except upon a disconnect where DTR remains ON and LSD turns Off. DTR must then toggle Off and ON to turn LSD ON. Use this setting for AT&T DATAKIT applications. Note that to use this configuration option, the DTR Action configuration option must be set to Stndrd_RS232 (&D1 or &D2). &C6 Bridge Retrain. LSD behaves as if it were set for Stndrd_RS232, except that it is turned off when a retrain condition lasts longer than 10 seconds, and turned on again when no retrain condition is detected for a period of 10 seconds.	Configure\Edit\ DTE Interface
&D*n*	**DTR Action** **&D0** Ignore. Modem ignores the true status of DTR and treats it as always ON. &D1 Off=Command Mode. Modem enters online Command Mode if connected when DTR switches Off. &D2 Standard RS232. DTR Signal is controlled by the DTE. &D3 Off=Reload Strap. Follows Standard RS232 operation, except that when DTR switches Off, the modem loads the Active (Saved) area into the Active (Operating) area. &D4 Controls On-Hook. Follows Standard RS232 operation, except that modem does not disconnect until DTR is lowered by the DTE. &D5 Controls TX Mute. Like Standard RS232, except that when DTR is lowered at the answering modem, the modem mutes transmitter output.	Configure\Edit\ DTE Interface

Table 13-1
(7 of 15)
3800*Plus* AT Commands

<table>
<tr><th>AT Command</th><th>Description</th><th>Front Panel Branch</th></tr>
<tr><td>&Fn</td><td>Select Factory Default Configuration Options
Loads factory configuration options into Active (Operating) area.
&F0 Async Dial
&F1 Sync Dial
&F2 Sync Leased: Answer
&F3 UNIX Dial
&F4 Sync Leased: Originate
&F5 Cellular (Mobile)
&F6 Cellular (PSTN)
The &F5 and &F6 commands are available only if ETC is installed.
If your modem is attached to a cellular telephone, use the &F5 command to configure the modem for cellular communications. &F5 (Cellular(Mobile)) sets the following configuration options:
<table><tr><th>Option</th><th>AT Command Value</th></tr><tr><td>Maximum Frame Size</td><td>\A4</td></tr><tr><td>Error Control Mode</td><td>\N4</td></tr><tr><td>Auto-Answer Rings</td><td>S0=3</td></tr><tr><td>No Answer Timeout</td><td>S7=120</td></tr><tr><td>No Carrier Disconnect</td><td>S10=100</td></tr><tr><td>V.32bis Train</td><td>S43=1</td></tr><tr><td>V.32bis Autorate</td><td>S76=3</td></tr><tr><td>V.42 ARQ Window Size</td><td>S89=9</td></tr><tr><td>Cellular Enhancements</td><td>S91=1</td></tr></table>If your modem is attached to a normal dial telephone line but sometimes communicates with a modem that is attached to a cellular phone, use the &F6 command. &F6 (Cellular(PSTN)) sets the following configuration options:
<table><tr><th>Option</th><th>AT Command Value</th></tr><tr><td>Transmit Level</td><td>&I99</td></tr><tr><td>Error Control Mode</td><td>\N4</td></tr><tr><td>No Answer Timeout</td><td>S7=120</td></tr><tr><td>No Carrier Disconnect</td><td>S10=100</td></tr><tr><td>V.32bis Train</td><td>S43=1</td></tr><tr><td>V.42 ARQ Window Size</td><td>S89=9</td></tr><tr><td>Cellular Enhancements</td><td>S91=1</td></tr></table>The &F0, &F3, &F5, and &F6 commands leave the modem in AT Command mode. The other commands place the modem into Dumb mode. The only way to return to AT command control is via the front panel.</td><td>Configure\Factory</td></tr>
<tr><td>&Gn</td><td>V.22bis Guard Tone
&G0 Disable.
&G1 550 Hz.
&G2 1800 Hz.</td><td>Configure\Edit\Dial Line</td></tr>
</table>

Table 13-1
(8 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
&I	**Dial Transmit Level** When Dial Transmit Level Type is set to Permissive, &I*n* sets Dial Transmit Level to a value between –10 and –32 dBm. &I99 and &I100 are available only if Enhanced Throughput Cellular (ETC) is installed and cause the level to be varied automatically according to conditions for ETC operation. &I10 –10 dBm &I11 –11 dBm • • • • &I32 –32 dBm &I99 Automatically adjusted according to the ETC1.0 specification. Use only with remote modems set to &I99, and limit the data rate to 4800 bps (S41=5). Set by &F6. &I100 Automatically adjusted according to the ETC1.1 specification. **NOTE:** &J0 overrides this command; &I*n* overrides the &J0 command.	Configure\Edit\Dial Line
&J*n*	**Dial Transmit Level Type** **&J0** Permissive (Approx. –9 dBm). **NOTE:** &J0 overrides the &I*n* command; &I*n* overrides the &J0 command.	Configure\Edit\Dial Line
&L*n*	**Leased Mode** &L0 Disables leased-line operation. &L1 2-wire originate leased-line operation. &L2 4-wire originate leased-line operation. &L3 2-wire answer leased-line operation. &L4 4-wire answer leased-line operation. The &L command will cause the modem to reset before entering or exiting Leased-Line mode. Therefore, it must be entered as the last command in an initialization string. The modem must be in Sync Leased mode (&F2 or &F4) for the &L command to work.	Configure\Edit\ Leased Line

Table 13-1
(9 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
&M*n* and &Q*n*	**Async/Sync Mode and DTE Dialer Type** **&M0, &Q0** Modem operates in Asynchronous mode and uses AT Command protocol. &M1, &Q1 Modem operates in Synchronous mode and uses AT Command protocol. &M2, &Q2 Modem operates in Synchronous mode and dials telephone number stored in directory location 1 when DTR signal turns Off and then ON. &M3, &Q3 Modem operates in Synchronous mode and uses AT Command protocol. &M6, &Q6 Modem operates in Synchronous mode and dials telephone number stored in directory location 1 when DTR signal turns Off and then ON and the leased line is down. &M231, &Q231 Modem operates in Asynchronous mode; the DTE Dialer Type is disabled. &M232, &Q232 Modem operates in Asynchronous mode; V.25bis Async dialing is enabled. &M233, &Q233 Modem operates in Synchronous mode; V.25bis Bisync dialing is enabled. &M234, &Q234 Modem operates in Synchronous mode; V.25bis HDLC dialing is enabled. &M235, &Q235 Modem operates in Asynchronous mode; AT&T Exclusive dialing is enabled. &M236, &Q236 Modem operates in Synchronous mode; the DTE Dialer Type is disabled. The &M2, &Q2, &M6, &Q6, &M231, &Q231, &M236, and &Q236 commands disable the use of AT commands and force the modem into Dumb mode. The only way to gain control of the modem is the front panel.	Configure\Edit\ DTE Dialer
&R*n*	**RTS Action** &R0 Standard RS232. RTS must be ON for the DTE to transmit to the modem. **&R1** Ignores RTS. Modem acts as if RTS is always ON. &R2 Simulated Control Carrier. RTS input controls the remote modem's LSD signal. &R3 Control Carrier. The DTE's RTS signal controls the modem's carrier signal.	Configure\Edit\ DTE Interface
&S*n*	**DSR Control** **&S0** Forced On. DSR output is constantly ON. &S1 Standard RS232. The modem controls DSR to the DTE, turning ON DSR when handshaking begins, and Off upon disconnect. &S2 Wink When Disconnect. DSR is normally ON, but is forced Off momentarily during a disconnect. &S3 Follows DTR. When the modem receives DTR from the DTE, it sends DSR to the DTE. &S4 On Early. DSR is Off when the modem is in an idle state, and goes ON when a command is received to enter Data mode. &S5 Delay to Data. Like Standard RS232, but DSR is not turned ON until the modem is in Data mode. &S6 Dial Backup Toggle. DSR is turned Off during a dial backup attempt, and ON when the attempt is completed.	Configure\Edit\ DTE Interface

Table 13-1
(10 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
&T*n*	**Tests** &T0 Abort. Stops any test in progress. &T1 Local Analog Loop. &T2 Pattern. Transmits and receives a 511 Bit Error Rate Test (BERT). &T3 Local Digital Loopback test. &T4 Enables Receive Remote Loopback Response configuration option. &T5 Disables Receive Remote Loopback Response configuration option. &T6 Remote Digital Loopback test. &T7 Remote Digital Loopback with Pattern. &T8 Local Loopback with Pattern. &T9 Self-Test.	Test &T4 and &T5: Configure\Edit\Tests
&V*n*	**View Configuration Options** Displays each configuration group within the Active (Operating), Active (Saved), Customer 1, and Customer 2 configuration areas as well as the telephone numbers stores in directory locations 1–10. The output of the &V command can be saved to a file and printed (using your communications software), providing both a record of your configuration and a worksheet for configuration enhancements. &V0 Active (Operating) configuration options. &V1 Active (Saved) configuration options. &V2 Customer 1 configuration options. &V3 Customer 2 configuration options. &V4 Directory locations 1–10.	None
&W*n*	**Write (Save to Memory)** Saves the current configuration options in Active (Operating) to one of three configuration areas. This is required to make any configuration changes permanent. &W0 Saved to Active(Save). &W1 Saved to Customer 1. &W2 Saved to Customer 2.	Configure\Save
&X*n*	**Transmit Clock Source** **&X0** Internal. Modem provides transmit clock source for synchronous data (Pin 15). &X1 External. Modem derives external transmit clock source provided on Pin 24 for synchronous data. &X2 Receive Clock Loop. Modem derives transmit clock source from receive signal for synchronous data (Pin 17).	Configure\Edit\ DTE Interface
&Z*n*=*x*	**Store Telephone Numbers** Modem saves the telephone numbers and dial command modifiers (if any) entered for *x* (up to 40 characters in length) in Directory Location *n* (1–10). For example, the command AT&Z1=5551234 stores the telephone number 555-1234 into directory location 1. To clear a telephone number from a memory location, issue the &Z*n*=*x* command without entering a telephone number.	Call Setup\ Change Directory

Table 13-1
(11 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
\A*n*	**Error Control Maximum Frame Size** \A0 64 \A1 128 \A2 192 **\A3** 256 \A4 32 \A5 16	Configure\Edit\ V42/MNP/Buffer
\C*n*	**Error Control Negotiate Buffer** **\C0** Disable. \C1 Enable. \C2 Disables and switches modem to Buffer mode.	Configure\Edit\ V42/MNP/Buffer
\D*n*	**CTS Control** **\D0** Forced On. Forces CTS to always ON. \D1 Standard RS232. \D2 Wink When Disconnect. CTS is turned Off for 1 to 2 seconds upon a disconnect. \D3 Follows DTR. The state of CTS follows the state of DTR.	Configure\Edit\ DTE Interface
\G*n*	**Modem to Modem Flow Control** **\G0** Disable. \G1 Enable.	Configure\Edit\ V42/MNP/Buffer
\K*n*	**Break Buffer Control, Send Break Control, Break Forces Escape** \K0 Discard Data / Break First / Enable \K1 Discard Data / Break First / Disable \K2 Keep Data / Break First / Enable \K3 Keep Data / Break First / Disable \K4 Keep Data / Data First / Enable **\K5** Keep Data / Data First / Disable \K6 Discard Break / Not Applic. / Disable	Break Buffer Control: Configure\Edit\ V42/MNP/Buffer Send Break Control: Configure\Edit\ V42/MNP/Buffer Break Forces Escape: Configure\Edit\ DTE Dialer
\N*n*	**Error Control Mode** \N0 Buffer Mode. \N1 Direct Mode. \N2 MNP or Disconnect. \N3 MNP or Buffer. \N4 V.42/MNP or Disconnect. **\N5** V.42/MNP or Buffer. \N6 LAPM or Disconnect. \N7 LAPM or Buffer.	Configure\Edit\ V42/MNP/Buffer

Table 13-1
(12 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
\Q*n*	**Flow Control of DTE, Flow Control of Modem** \Q0 Disable / Disable \Q1 XON/XOFF / XON/XOFF **\Q2** CTS to DTE / Disable \Q3 CTS to DTE / RTS to Mdm \Q4 XON/XOFF / Disable \Q5 Disable / XON/XOFF \Q6 Disable / RTS to Mdm	Configure\Edit\ V42/MNP/Buffer
\T*n*	**No Data Disconnect Timer** **\T0** Disable. \T*n* Where n is a value from 1 to 255 in 1-minute increments.	Configure\Edit\ Line Dialer
\X*n*	**XON/XOFF Passthrough Flow Control** **\X0** Disable. \X1 Enable.	Configure\Edit\ V42/MNP/Buffer
%A*n*	**Error Control Fallback Character** %A*n* Where *n* is an ASCII value from 0 to 127. Factory default is 013 ASCII.	Configure\Edit\ V42/MNP/Buffer

Table 13-1
(13 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
%B*n*, %BL*n*	**Modulation/Data Rate** Sets the modulation and maximum dial VF rate. The same function can be performed with S-register S41; the %B and %BL commands are provided for compatibility with environments where those commands are used. The %B300 and %B1200 commands work in conjunction with the B (ITU-T/ Bell Mode) command to determine modulation. The %B2400 through %B33600 commands set the modem for V.34 or V.34 extended operation. The %BL2400 through %BL19200 commands set the modem for V.22bis, V.32, V.32bis, or V.32*terbo* operation. %B300 V.21 or Bell 103 — max. rate 300 bps (S41=10, S41=11) %B1200 V.22 or Bell 212A — max. rate 1200 bps (S41=7, S41=8) %B2400 V.34 — max. rate 2400 bps (S41=40) %B4800 V.34 — max. rate 4800 bps (S41=39) %B7200 V.34 — max. rate 7200 bps (S41=38) %B9600 V.34 — max. rate 9600 bps (S41=37) %B12000 V.34 — max. rate 12,000 bps (S41=36) %B14400 V.34 — max. rate 14,400 bps (S41=35) %B16800 V.34 — max. rate 16,800 bps (S41=34) %B19200 V.34 — max. rate 19,200 bps (S41=33) %B21600 V.34 — max. rate 21,600 bps (S41=32) %B24000 V.34 — max. rate 24,000bps (S41=31) %B26400 V.34 — max. rate 26,400 bps (S41=30) %B28800 V.34 — max. rate 28,800 bps (S41=29) %B31200 V.34 — max. rate 31,200 bps (S41=28) **%B33600 V.34 — max. rate 33,600 bps (S41=27)** %BL2400 V.22bis — max. rate 2400 bps (S41=6) %BL4800 V.32bis/V.32 — max. rate 4800 bps (S41=5) %BL7200 V.32bis — max. rate 7200 bps (S41=4) %BL9600 V.32bis/V.32 — max. rate 9600 bps (S41=3) %BL12000 V.32bis — max. rate 12,000 bps (S41=2) %BL14400 V.32bis — max. rate 14,400 bps (S41=1) %BL16800 V.32*terbo* — max. rate 16,800 bps (S41=21) %BL19200 V.32*terbo* — max. rate 19,200 bps (S41=20)	Configure\Edit\ Dial Line
%C*n*	**MNP5 Data Compression** %C0 Disable. **%C1** Enable.	Configure\Edit\ V42/MNP/Buffer

Table 13-1
(14 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
%R	**Async DTE Rate** Sets the DTE rate for Asynchronous mode. This configuration option has no effect in Sync or Async Direct modes, where the DTE rate always equals the VF rate. %R*n* must be the last command in a command string. The %R*n* command does not disable autobauding. If a command is received from the DTE at a new rate, the modem will autobaud to that rate, replacing the current %R value. If a factory preset is selected with an AT&F*n* command, the autobauding rate is not changed. Rates above 19,200 bps are not defined in RS232E, but can function correctly in many cases. For higher rates, take the following precautions: • Use as short a DTE cable as possible. A special low-capacitance cable may be required. • For an IBM-compatible PC, ensure that the serial port uses a buffered UART such as the 16550. If you experience overruns, it may be that your DTE cannot handle higher DTE rates. Try a lower value. %R300 0–300 bps %R1200 1200 bps %R2400 2400 bps %R4800 4800 bps %R7200 7200 bps %R9600 9600 bps %R12000 12,000 bps %R14400 14,400 bps **%R19200 19,200 bps** %R28800 28,800 bps %R38400 38,400 bps %R57600 57,600 bps %R76800 76,800 bps %R115200 115,200 bps	Configure\Edit\ DTE Interface
#DM*n*	**SDC Delay Minimization** Minimizes the delay introduced by SDC by allowing the modem to transmit a DTE frame to its DTE in a discontinuous way. **#DM0** No delay minimization. The modem does not begin transmitting a frame to its DTE until the entire frame has been received. #DM1 Delay minimization. The modem begins to transmit data from a DTE frame to its DTE even if the end of the DTE frame has not yet been received by the modem.	Configure\Edit\ V42/MNP/Buffer
#Q*n*	**Sync Flow Ctrl** Controls the type of synchronous data flow control while using data compression. **#Q0** No flow control. #Q1 Flow control using transmit clock (circuit 114). #Q2 Flow control using CTS (circuit 106).	Configure\Edit\ V42/MNP/Buffer

Table 13-1
(15 of 15)
3800*Plus* AT Commands

AT Command	Description	Front Panel Branch
#SC*n*	**Sync Comp Mode** Enables and disables synchronous data compression. **#SC0** Disable Synchronous Data Compression mode. #SC1 Enable Synchronous Data Compression mode. The factory setting is Disable.	Configure\Edit\ V42/MNP/Buffer
″H*n*	**V.42bis Compression** ″H0 Disable. ″H1 Transmit only. (Not available from DCP.) ″H2 Receive only. (Not available from DCP.) ″**H3** Transmit and Receive. (Equivalent to Enabled option on DCP.)	Configure\Edit\ V42/MNP/Buffer
″L*n*	**Disconnect at 300 bps** ″L0 Disable. ″L1 Enable.	None

S-Register List

S-registers affect the operating parameters of 3800*Plus* modems. S-registers are only applicable when the DTE Dialer Type configuration option is set for AT. (See &M*n* command.)

Table 13-2 lists all S-registers supported by 3800*Plus* modems. The first column lists the S-register. The second column lists all possible values for that register. The third column lists the key sequence used to enter the equivalent from the front panel. Use the reference in this column to locate commands in Chapter 8, *Configure Branch* if further description is necessary.

S-Register Format

S-registers can be displayed and/or modified when the modem is in Command mode. To display the value of an S-register, issue the following command:

TYPE: ATS*n*?

Where: *n* is the register number

PRESS: Enter

To modify the value of an S-register, issue the following command:

TYPE: ATS*n*=*r*

Where: *n* is the register number, and
r is the new value

PRESS: Enter

In Table 13-2, the value for *n* is listed in the S-register column, and the value for *r* is listed in the Description column.

Table 13-2
(1 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S0	**Auto-Answer Ring Number** Register determines number of rings the modem will count before automatically answering a call. Enter zero (0) if you do not want the modem to automatically answer any calls. Otherwise, enter a value from 1–255 for the number of rings to count before answering. Factory setting is 1.	Configure\Edit\ Line Dialer
S2	**AT Escape Character** Register determines ASCII value used for escape sequence to enter Command mode from Data mode. Enter a value from 1 to 127 for the escape character. Any value greater than 127 causes the modem to disable the escape sequence. When the escape sequence is disabled, the modem cannot return to Command mode until the call is disconnected. Factory setting is 43 (+ key).	Configure\Edit\ DTE Dialer
S3	**Carriage Return Character** Register determines ASCII value used as the carriage return (Return key). This character is used to end command lines and result codes. Enter a value from 0 to 127 for the command end character. Factory setting is 13 (carriage return key). **NOTE:** The &W command used to save this change must be on a separate line. This ensures both that the change is intentional, and that the DTE can enter the new character.	Configure\Edit\ DTE Dialer

Table 13-2
(2 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S4	**Line Feed Character** Register determines ASCII value used as the line feed character. Enter a value from 0–127 for the line feed character. Factory setting is 10 (ASCII carriage return or line feed).	Configure\Edit\ DTE Dialer
S5	**Backspace Character** Register determines ASCII value used as the backspace (Backspace key). This character moves the cursor to the left and erases the previous character. Enter a value from 0–127. Factory setting is 08 (backspace key).	Configure\Edit\ DTE Dialer
S6	**Blind Dial Pause** Register determines how long (in seconds) the modem waits after going off-hook before dialing a telephone number if using result code X0, X1, or X3. Enter a value from 2–255 seconds. Factory setting is 2 seconds.	Configure\Edit\ Line Dialer
S7	**No Answer Timeout** Register determines how long (in seconds) an originating modem waits before abandoning a call when no answer tone is received. Enter a value from 1–255 seconds. Factory setting is 45 seconds.	Configure\Edit\ Line Dialer
S8	**“,” Pause Time for the Dial Modifier** Register determines how long (in seconds) the modem pauses when it encounters a comma (,) in the Dial command string. Enter a value from 0–255 seconds. Factory setting is 2 seconds.	Configure\Edit\ Line Dialer
S10	**No Carrier Disconnect** Register determines how long (in tenths of seconds) the modem allows the carrier signal to be off before disconnecting the call. Enter a value from 0–254 in 0.1 second increments. (A value of 255 disables this register.) Factory setting is 20 (2 seconds).	Configure\Edit\ Line Dialer
S12	**Escape Guard Time** Register sets the value (in 20-millisecond increments) for the required pause before and after the escape sequence is issued. The guard time prevents the modem from interpreting data as the escape sequence characters. Enter a value from 0–255 in 20-millisecond increments. For example, the factory setting of 50 equals 1000 milliseconds or one second. Factory setting is 50 (1 second).	Configure\Edit\ DTE Dialer

Table 13-2
(3 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S14	**Asymmetric Rate Mode – Dial Line** Register determines whether VF rates for transmitting and receiving are identical when using V.34 modulation. Enabling the function permits the two rates to be different. Register has the following values: 0=Enable 1=Disable Factory setting is Enable.	Configure\Edit\ Dial Line
S15	**Asymmetric Rate Mode – Leased Line** Register determines whether VF rates for transmitting and receiving are identical when using V.34 modulation. Enabling the function permits the two rates to be different. Register has the following values: 0=Enable 1=Disable Factory setting is Enable.	Configure\Edit\ Leased Line
S18	**Test Timeout** Register sets the duration (in seconds) for the modem tests. This automatically cancels any test in progress after the time of this register expires. Any test can be manually canceled by issuing the escape sequence (+++) followed by the &T0 command. Enter a value from 0–255 seconds. (A value of 0 disables this register.) Factory setting is Disable (0).	Configure\Edit\ Tests
S23	**Proactive Retrain** Register determines whether Proactive Retrain occurs. Disabling Proactive Retrain reduces the number of retrains while increasing the exposure to bit errors. Register has the following values: 0=Enable 1=Disable Factory setting is Enable.	Configure\Edit\ Dial Line
S25	**AutoSync Start Pause** If Autosync is enabled, this register represents the amount of time the modem will pause before entering Autosync mode. Enter a value from 0–30 seconds. (A value of 0 disables this register.) Factory setting is Disable (0).	None
S26	**RTS-to-CTS Delay** Register sets the length of time (in 10-millisecond increments) the modem waits after receiving RTS before issuing CTS to the DTE. Enter a value from 0–255. Factory setting is 0 milliseconds.	Configure\Edit\ DTE Interface

Table 13-2
(4 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S28	**SDC Negotiation** Controls negotiation between two modems attempting to connect using SDC. Register has the following values: 0 = LAPM_Buffer 1 = LAPM_Discon The factory setting is LAPM_Buffer.	Configure\Edit\ V42/MNP/Buffer
S29	**SDC Idle Fill** Determines whether the modem uses an HDLC flag or mark to fill the time between DTE frame transfers. Register has the following values: 0 = Flag_Fill 1 = Mark_Fill The factory setting is Flag_Fill.	Configure\Edit\ V42/MNP/Buffer
S30	**Sync DTE Rate** Identifies the synchronous DTE's operating rate to the modem. Register has the following values: 0 = 128,000 bps 1 = 115,200 bps 2 = 112,000 bps 3 = 96,000 bps 4 = 76,800 bps 5 = 72,000 bps 6 = 64,000 bps 7 = 57,600 bps 8 = 56,000 bps 9 = 48,000 bps 10 = 38,400 bps 11 = 28,800 bps 12 = 19,200 bps 13 = 14,400 bps 14 = 9600 bps 15 = 4800 bps 16 = 2400 bps 17 = 1200 bps The factory setting is 128,000 bps.	Configure\Edit\ DTE Interface
S31	**SDC Bit Encoding** Determines the type of bit encoding used when transmitting synchronous DTE data. Register has the following values: 0 = NRZ 1 = NRZI The factory setting is NRZ.	Configure\Edit\ V42/MNP/Buffer

Table 13-2
(5 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S32	**SyncDTE CRC** Determines whether the CRC of the DTE frame is transmitted from modem to modem. Register has the following values: 0 = Ignore 1 = CRC16 The factory setting is Ignore.	Configure\Edit\ V42/MNP/Buffer
S33	**Buffer Size In Buffer Mode** Limits the amount of data buffered during Buffer Mode operation. Register has the following values: 0 = Normal (the modem buffers data as usual in Buffer Mode) 1 = Minimized (a minimal amount of data is buffered in Buffer Mode) Factory setting is 0 (Normal).	
S35	**Auto Redial** Auto Redial allows repeated automatic dial backup attempts by specifying the range of Directory Locations that can be tried. On leased lines with dial backup, Auto Redial (S35) works in conjunction with the Bad Lines Auto Originate and Rate Auto Originate options. A redial attempt is made in response to a bad phone number, a busy signal, no answer, or no quiet answer. The modem must be in Originate mode. Register has the following values: 0 = Directory Location 1 1 = Directory Locations 1–2 2 = Directory Locations 1–3 3 = Directory Locations 1–4 • • • • 9 = Directory Locations 1–10 Factory setting is 0 (Directory Location 1).	Configure\Edit\ Leased Line
S36	**Rate Auto Originate** Initiates a dial backup call, using the phone number or numbers determined by S-register S37 when the leased-line rate of the modem falls back to or below a certain speed. Register has the following values: 0=Disable 1=On fallback to 4,800 2=On fallback to 7,200 3=On fallback to 9,600 4=On fallback to 12,000 5=On fallback to 14,400 6=On fallback to 16,800 **NOTE:** Rate Auto-Originate is valid only when V.32bis Autorate is enabled (S76=0) and when running V.32bis modulation.	Configure\Edit\ Leased Line

Table 13-2
(6 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S37	**DTR Auto Redial** DTR Auto Redial allows repeated automatic dial backup attempts by specifying the range of Directory Locations that can be tried. A redial attempt is made in response to a bad phone number, a busy signal, no answer, or no quiet answer. The modem must be in Originate mode. When DTE Dialer Type is DTR=Dirs, DTR Auto Redial (S37) works in conjunction with the DTR Cont Repeat (S38) configuration option. A redial attempt is made in response to a low to high transition of DTR. Register has the following values: 0= Directory Location 1 1= Directory Locations 1–2 2= Directory Locations 1–3 3= Directory Locations 1–4 • • • • 9= Directory Locations 1–10 **NOTE:** The modem must be in Originate mode to perform an automatic dial backup.	Configure\Edit\ Line_Dialer
S38	**DTR Cont Repeat** Determines whether automatic dialing of dial backup directory locations will be repeated continuously, or halted after the first pass. Regardless of the setting of S38, dialing is locked out after ten failed attempts to connect to the same number. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\ DTE_Dialer
S39	**Receive Buffer Disconnect Delay** Determines the maximum amount of time the modem can continue to send data in its Receive Buffer to the DTE after the modem is commanded by the DTE to disconnect, or after the modem detects a line disconnect. Register has the following values: 0=Disable (Immediate disconnect) 1=1 second 2=2 seconds • • • • 255=255 seconds Factory setting is Disable (0).	Configure\Edit\ V42/MNP/Buffer
S40	**Auto Make Busy** Register determines if the modem goes off-hook under certain conditions. This register should only be enabled when the modem is located behind a user's Private Branch Exchange (PBX). Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\ Line Dialer

Table 13-2
(7 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S41	**Dial-Line Rate** Register determines the modem's data rate and modulation scheme for operation on dial lines. Register has the following values: 1=14,400 (V.32bis) 2=12,000 (V.32bis) 3=9600 (V.32bis/V32) 4=7200 (V.32bis) 5=4800 (V.32bis/V.32) 6=2400 (V.22bis) 7=1200 (V.22) 8=1200 (212A) 10=0–300 (V21) 11=0–300 (103J) 20=19,200 (V.32*terbo*) 21=16,800 (V.32*terbo*) 27=33,600 (V.34) 28=31,200 (V.34) 29=28,800 (V.34) 30=26,400 (V.34) 31=24,000 (V.34) 32=21,600 (V.34) 33=19,200 (V.34) 34=16,800 (V.34) 35=14,400 (V.34) 36=12,000 (V.34) 37=9600 (V.34) 38=7200 (V.34) 39=4800 (V.34) 40=2400 (V.34) Factory setting is 33,600 (V.34).	Configure\Edit\ Dial Line
S43	**Train Time** Register controls the modem's train time for V.34, V.32*terbo*, V.32bis, and V.32 mode. Register has the following values: 0=Long 1=Short Factory setting is Long.	Configure\Edit\ Dial Line

Table 13-2
(8 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S44	**Leased-Line Rate** Register determines the modem's data rate and modulation scheme for operation on either 2-wire or 4-wire leased lines in either Answer or Originate mode. Register has the following values: 0, 1=14,400 (V.32bis) 2=12,000 (V.32bis) 3=9600 (V.32bis) 4=7200 (V.32bis) 5=4800 (V.32bis) 6=2400 (V.22bis) 11=14,400 (V.33) 12=12,000 (V.33) 13 =9600 (V.29) 14=7200 (V.29) 15=4800 (V.29) 18=19,200 (V.32*terbo*) 19=16,800 (V.32*terbo*) 25=33,600 (V.34) 26=31,200 (V.34) 27=28,800 (V.34) 28=26,400 (V.34) 29=24,000 (V.34) 30=21,600 (V.34) 31=19,200 (V.34) 32=16,800 (V.34) 33=14,400 (V.34) 34=12,000 (V.34) 35=9600 (V.34) 36=7200 (V.34) 37=4800 (V.34) 38=2400 (V.34) Factory setting is 33,600 (V.34).	Configure\Edit\ Leased Line
S45	**Leased TX Level** Register determines the modem's transmit power output level over leased lines. Enter a value from 0–15 dBm. Factory setting is 0 dBm.	Configure\Edit\ Leased Line
S46	**Bad Lines Auto Originate** Register determines if the modem performs an automatic dial backup if the leased lines fail. Register has the following values: 0=Disable 1=30 seconds 2=20 seconds 3=60 seconds 4=90 seconds 5=120 seconds • • • • 21=600 seconds Factory setting is Disable. Note that the S46=2 command has an effect that is out of sequence with the other values.	Configure\Edit\ Leased Line

Table 13-2
(9 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S47	**Auto Dial Standby** Register determines if the modem performs an automatic dial standby if in Dial Backup mode. Register has the following values: 0=Disable 1=15 minutes 2=1 hour 3=4 hours 255=Test(2min) Factory setting is Disable.	Configure\Edit\ Leased Line
S48	**Leased-Line Carrier On Level** Register determines if the modem disconnects if the carrier signal on leased lines falls below –26 dBm or –43 dBm. Register has the following values: 0= –43 dBm 1= –26 dBm Factory setting is –43 dBm.	Configure\Edit\ Leased Line
S49	**Transmit Buffer Disconnect Delay** Determines the maximum amount of time the modem can continue to send data in its Transmit Buffer to the remote modem after it is commanded by the DTE to disconnect. Register has the following values: 0=Disable (Immediate disconnect) 1=1 second 2=2 seconds • • • • 255=255 seconds Factory setting is 10 seconds.	Configure\Edit\ V42/MNP/Buffer
S51	**DTE RL (CT140)** Register determines if the modem performs a remote digital loopback if it receives a CT140 signal from the DTE. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\Tests
S52	**DTE LL (CT141)** Register determines if the modem performs a local analog loopback if it receives a CT141 signal from the DTE. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\Tests

Table 13-2
(10 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S53	**V.54 Address** Identifies the address of the modem to be placed in a loopback test. Register has the following values: 0 =Disable 1–34 =Modem address Factory setting is Disable.	Configure\Edit\Tests
S54	**V.54 Device Type** Identifies where the modem is physically located in the network. Register has the following values: 0=Peripheral 1=Intermediate Factory setting is Peripheral.	Configure\Edit\Tests
S55	**Access from Remote** Register determines if a modem's DCP can be accessed by a remote modem. Register has the following values: 0=Enable 1=Disable The factory default templates do not affect S55.	Configure\Edit\Misc
S56	**Remote Access Password** (Part 1) Register allows entry of the first pair (leftmost) of digits of a remote access password. Any value from 00 to 99 is valid. For example, if the remote access password is 12345678, then S56=12.	Configure\Edit\Misc
S57	**Remote Access Password** (Part 2) Register allows entry of the second pair of digits of a remote access password. Any value from 00 to 99 is valid.	Configure\Edit\Misc
S58	**Remote Access Password** (Part 3) Register allows entry of the third pair of digits of a remote access password. Any value from 00 to 99 is valid.	Configure\Edit\Misc
S59	**Remote Access Password** (Part 4) Register allows entry of the fourth pair (rightmost) of digits of a remote access password. Any value from 00 to 99 is valid.	Configure\Edit\Misc
S61	**CT111 Rate Control** Register determines if CT111 Rate is disabled, set for Fallback 1 or Fallback 2. CT111 Rate allows the DTE to control modem rate via Pin 23 of the EIA-232-D interface. This configuration option determines the effect of the DTE Rate Control signal. It is only valid in Async Direct mode and Synchronous mode. For proper operation, disable the V32bis Autorate and V32bis Automode configuration options. Register has the following values: 0=Disable 1=Fallback 1 2=Fallback 2 Factory setting is Disable.	Configure\Edit\ DTE Interface

Table 13-2
(11 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S62	**V.25bis Coding** Register identifies to the modem the type of coding used by the DTE while in V.25bis mode. Register has the following values: 0=ASCII 1=EBCDIC Factory setting is ASCII.	Configure\Edit\ DTE Dialer
S63	**V.25bis Idle Character** Register identifies to the modem the type of idle fill used by the DTE while in V.25bis mode. Register has the following values: 0=Mark 1=Flag Factory setting is Mark.	Configure\Edit\ DTE Dialer
S64	**V.25bis New Line Character** Register identifies to the modem the type of line terminator used by the DTE while in V.25bis mode. Register has the following values: 0=Carriage Return and Line Feed 1=Carriage Return 2=Line Feed Factory setting is carriage return and line feed (CR + LF).	Configure\Edit\ DTE Dialer
S66	**NMS Call Messages** Register determines if the modem sends information regarding status (Call Progress) and/or sends summarized call statistics (Call Connect) to the dial network management system (COMSPHERE 6700 Series NMS). Register has the following values: 0=Call Connect & Progress 1=Disable 2=Call Connect Only 3=Call Progress Only The factory default templates do not affect S66.	Configure\Edit\Misc
S67	**Directory Location 1 Callback** Register determines if the modem uses the single number callback function. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\Misc
S69	**Make Busy Via DTR** Register determines if the modem goes off-hook (busy) when DTR is Off. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\ Line Dialer

Table 13-2
(12 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S74	**Network Position Identification** Register identifies each modem as either a control or tributary modem. Register has the following values: 0=Tributary 1=Control Factory setting is Tributary for the 3810*Plus*. Factory setting is Control for the 3811*Plus*.	Configure\Edit\Misc
S75	**Network Management Address** Register determines the modem's network address. This address is used when accessing the modem from the NMS. Enter a value from 0 (network address 001) to 255 (network address 256). The factory default templates do not affect S75.	Configure\Edit\Dial
S76	**Autorate (Dial Line)** Register determines if Autorating is used on dial lines when connected in V.32bis or V.34 mode. Register has the following values: 0=Enable 1=Disable 2=Start at 4800 bps 3=Start at 9600 bps Factory setting is Enable.	Configure\Edit\ Dial Line
S77	**DTR Alarm Reporting** Register determines whether an alarm is sent to the NMS controller when the DTR signal has been off for more than 10 seconds. Register has the following values: 0=Disable 1=Enable The factory default templates do not affect S77.	Configure\Edit\Misc
S78	**Automode (Dial Line)** Register allows the modem (when operating on dial lines) to automatically detect and connect to the remote modem's modulation scheme. If the modem is in a modem pool attached to a System 85 Private Branch Exchange (PBX), S78 should be set to 2. This modifies parameters used during connection to the PBX. Register has the following values: 0=Enable 1=Disable 2=System 85 Factory setting is Enable.	Configure\Edit\ Dial Line

Table 13-2
(13 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S80	**No Data Disconnect Trigger Signal** Register determines whether Pin 2 (transmit data) or Pin 3 (receive data) of the modem's RS-232 serial interface is monitored so that the modem can disconnect the call if there is no activity for a certain period. (See the \T command.) Register has the following values: 0=Transmit or Receive 1=Transmit only 2=Receive only 3=Transmit and Receive Factory setting is 3.	Configure\Edit\ Line Dialer
S82	**Autorate (Leased Line)** Register determines if Autorating is used on leased lines when connected in V.32bis or V.34 mode. Register has the following values: 0=Enable 1=Disable Factory setting is Enable.	Configure\Edit Leased Line
S83	**MI/MIC Dialing** On Model 3811*Plus* only, register determines if MI/MIC control leads can be used to force the modem into the originate handshake after first dialing a call. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\ Line Dialer
S84	**AT Command Mode** Register determines how the modem responds to valid and invalid AT commands. Register has the following values: 0=Normal 1=No ERROR 2=No Strap or ERROR Factory setting is Normal.	Configure\Edit\ DTE Dialer
S85	**Fast Disconnect** Register allows the modem to disconnect immediately after receiving a disconnect command from a local DTE or its own diagnostic control panel. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\ Line Dialer

Table 13-2
(14 of 15)
3800*Plus* S-Registers

AT Command	Description	Front Panel Branch
S88	**Straps When Disconnected** Register determines whether the Active(Operating) area is reloaded upon a disconnect. Register has the following values: 0 (or 231)=No Change 1 (or 232)=Reload 2 (or 233)=Reload with No AT Change **NOTE:** Reload with No AT Change can be saved only if the save command (&W) follows the S88=2 command on the same command line. The factory default templates do not affect S88.	Configure\Edit\Misc
S89	**V.42 ARQ Window Size Increase** Register allows the V.42 Automatic Request for Transmission (ARQ) window size to be set to a value from 6 to 15 frames to accommodate satellite delays. Register has the following values: 0=6 frames (default) 1=7 frames 2=8 frames 3=9 frames • • • • 9=15 frames This command applies only to connections made using V.42bis data compression or V.42 error control. Factory setting is 6 frames.	None
S90	**DTE Rate=VF Rate** Register forces the DTE (computer) data rate to be equal to the VF (telephone line) data rate. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\ DTE Interface
S91	**Cellular Enhancements** Valid only if ETC is installed, register determines whether parameters are set to improve performance over a cellular link. Should be enabled when the remote modem is using a cellular connection. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\ V42/MNP/Buffer

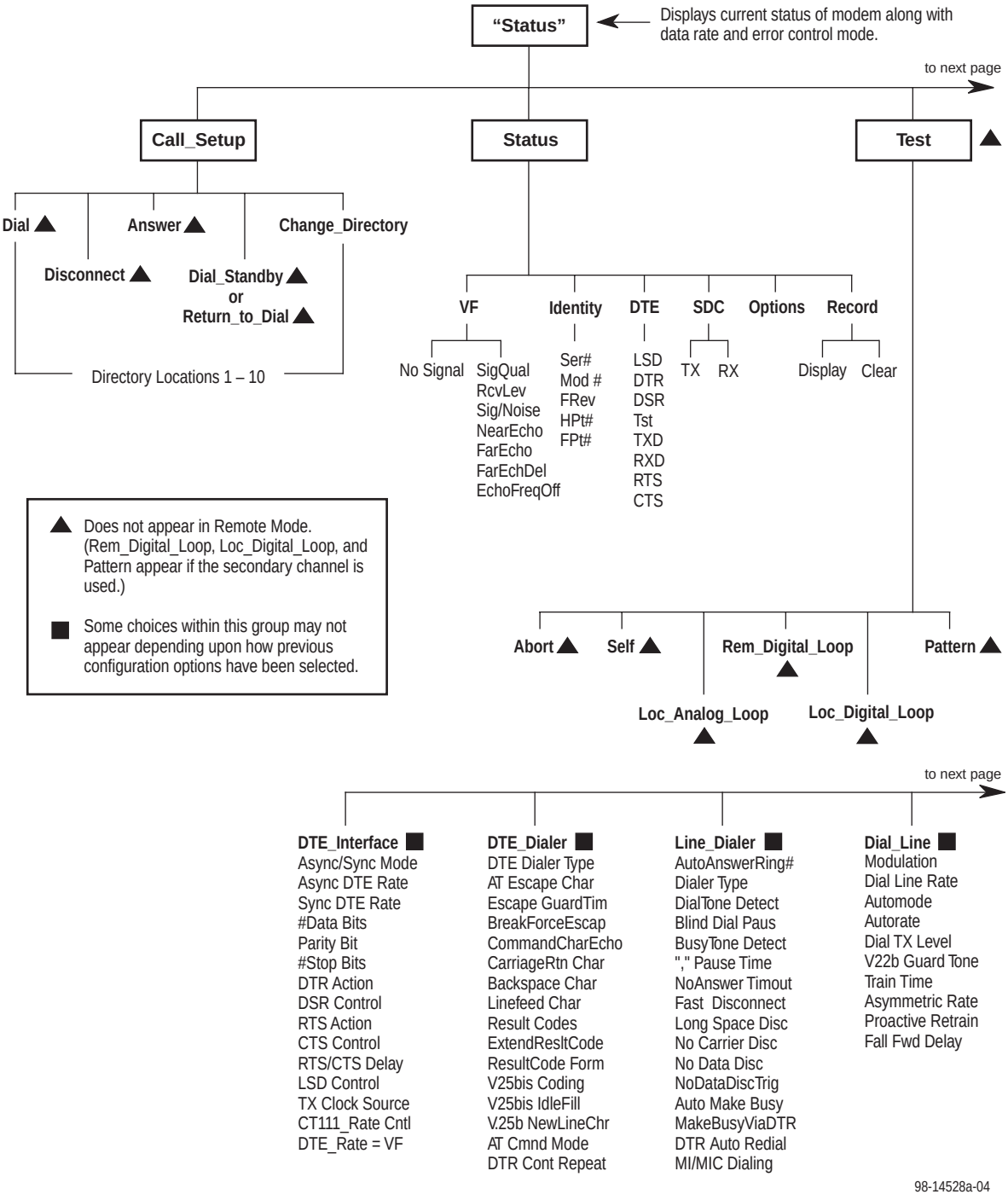
Table 13-2
(15 of 15)
3800*Plus* S-Registers

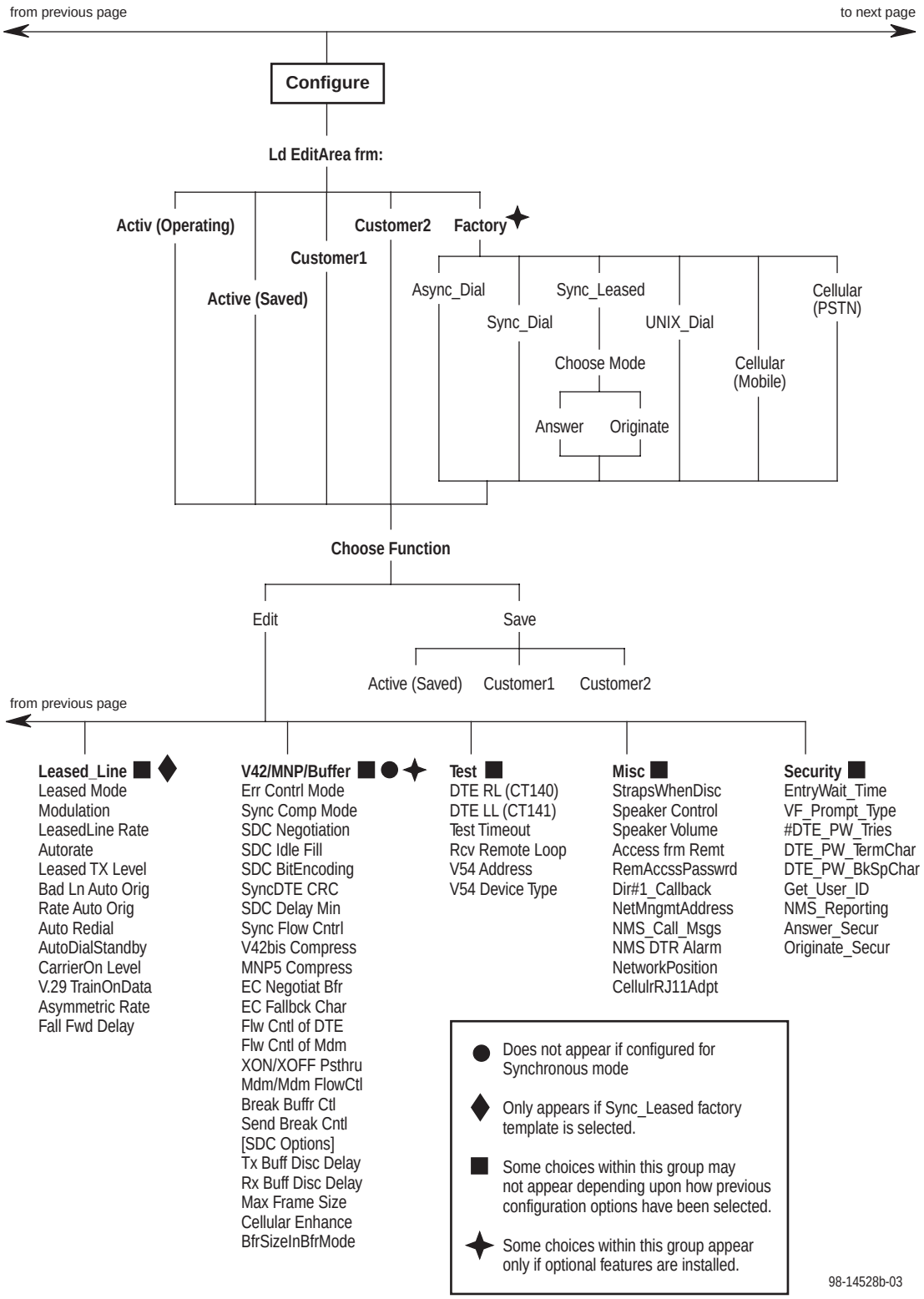
AT Command	Description	Front Panel Branch
S92	**V.29 Train On Data** Register determines whether the modem must receive a standard V.29 training sequence in order to enter data mode (Disable) or whether it should use the received data mode for training (Enable). Effective only if the V.29 feature is installed and V.29 is selected for the leased-line rate. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit Leased Line
S93	**RJ11 Cellular Adapt** Valid only if ETC is installed, register controls support for an RJ11 connection, including generation of the ETC 1.1 Calling Tone during call origination. Register has the following values: 0=Disable 1=Enable Factory setting is Disable.	Configure\Edit\Misc

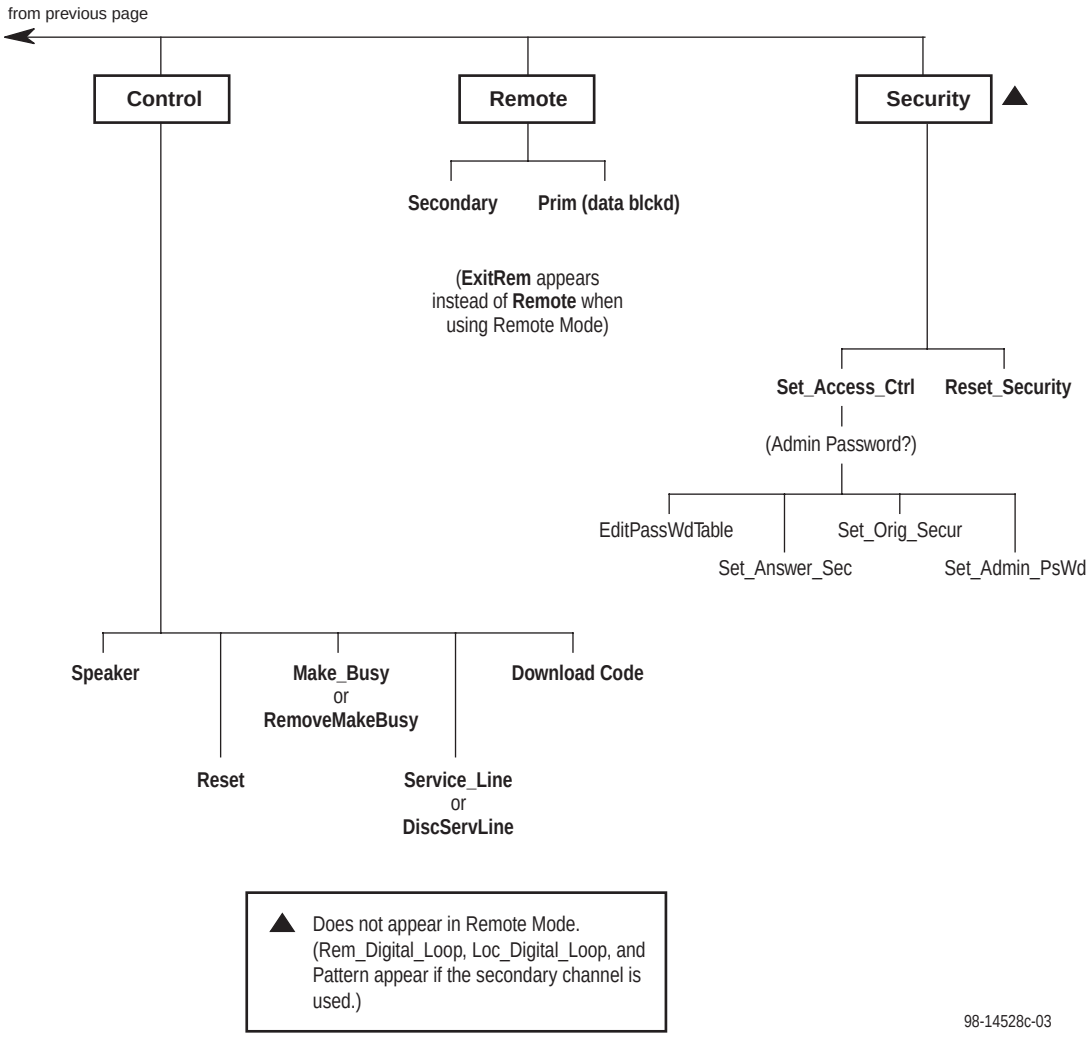
Menu Tree A

Overview

The following pages hold graphic representations of the general menu structure of the front panel or SDCP displays. The model, installed features, and configuration options all may affect what is actually displayed at each level of the menus.


"Status"
Displays current status of modem along with data rate and error control mode.
to next page
Call_Setup
Status
Test
Dial ▲
Answer ▲
Change_Directory
Disconnect ▲
Dial_Standby ▲ or Return_to_Dial ▲
Directory Locations 1 – 10
VF
Identity
DTE
SDC
Options
Record
No Signal
SigQual
RcvLev
Sig/Noise
NearEcho
FarEcho
FarEchDel
EchoFreqOff
Ser#
Mod #
FRev
HPt#
FPt#
LSD
DTR
DSR
Tst
TXD
RXD
RTS
CTS
TX
RX
Display
Clear
▲ Does not appear in Remote Mode. (Rem_Digital_Loop, Loc_Digital_Loop, and Pattern appear if the secondary channel is used.)
■ Some choices within this group may not appear depending upon how previous configuration options have been selected.
Abort ▲
Self ▲
Rem_Digital_Loop ▲
Pattern ▲
Loc_Analog_Loop ▲
Loc_Digital_Loop ▲
to next page
DTE_Interface ■
Async/Sync Mode
Async DTE Rate
Sync DTE Rate
#Data Bits
Parity Bit
#Stop Bits
DTR Action
DSR Control
RTS Action
CTS Control
RTS/CTS Delay
LSD Control
TX Clock Source
CT111_Rate Cntl
DTE_Rate = VF
DTE_Dialer ■
DTE Dialer Type
AT Escape Char
Escape GuardTim
BreakForceEscap
CommandCharEcho
CarriageRtn Char
Backspace Char
Linefeed Char
Result Codes
ExtendResltCode
ResultCode Form
V25bis Coding
V25bis IdleFill
V.25b NewLineChr
AT Cmnd Mode
DTR Cont Repeat
Line_Dialer ■
AutoAnswerRing#
Dialer Type
DialTone Detect
Blind Dial Paus
BusyTone Detect
"," Pause Time
NoAnswer Timout
Fast Disconnect
Long Space Disc
No Carrier Disc
No Data Disc
NoDataDiscTrig
Auto Make Busy
MakeBusyViaDTR
DTR Auto Redial
MI/MIC Dialing
Dial_Line ■
Modulation
Dial Line Rate
Automode
Autorate
Dial TX Level
V22b Guard Tone
Train Time
Asymmetric Rate
Proactive Retrain
Fall Fwd Delay
98-14528a-04


from previous page
to next page
Configure
Ld EditArea frm:
Activ (Operating)
Customer2
Factory
Customer1
Active (Saved)
Async_Dial
Sync_Leased
Cellular (PSTN)
Sync_Dial
UNIX_Dial
Choose Mode
Cellular (Mobile)
Answer
Originate
Choose Function
Edit
Save
Active (Saved)
Customer1
Customer2
from previous page
Leased_Line
Leased Mode
Modulation
LeasedLine Rate
Autorate
Leased TX Level
Bad Ln Auto Orig
Rate Auto Orig
Auto Redial
AutoDialStandby
CarrierOn Level
V.29 TrainOnData
Asymmetric Rate
Fall Fwd Delay
V42/MNP/Buffer
Err Contrl Mode
Sync Comp Mode
SDC Negotiation
SDC Idle Fill
SDC BitEncoding
SyncDTE CRC
SDC Delay Min
Sync Flow Cntrl
V42bis Compress
MNP5 Compress
EC Negotiat Bfr
EC Fallbck Char
Flw Cntl of DTE
Flw Cntl of Mdm
XON/XOFF Psthru
Mdm/Mdm FlowCtl
Break Buffr Ctl
Send Break Cntl
[SDC Options]
Tx Buff Disc Delay
Rx Buff Disc Delay
Max Frame Size
Cellular Enhance
BfrSizeInBfrMode
Test
DTE RL (CT140)
DTE LL (CT141)
Test Timeout
Rcv Remote Loop
V54 Address
V54 Device Type
Misc
StrapsWhenDisc
Speaker Control
Speaker Volume
Access frm Remt
RemAccssPasswrd
Dir#1_Callback
NetMngmtAddress
NMS_Call_Msgs
NMS DTR Alarm
NetworkPosition
CellulrRJ11Adpt
Security
EntryWait_Time
VF_Prompt_Type
#DTE_PW_Tries
DTE_PW_TermChar
DTE_PW_BkSpChar
Get_User_ID
NMS_Reporting
Answer_Secur
Originate_Secur
Does not appear if configured for Synchronous mode
Only appears if Sync_Leased factory template is selected.
Some choices within this group may not appear depending upon how previous configuration options have been selected.
Some choices within this group appear only if optional features are installed.
98-14528b-03


from previous page
Control
Remote
Security ▲
Secondary
Prim (data blckd)
(ExitRem appears instead of Remote when using Remote Mode)
Set_Access_Ctrl
Reset_Security
(Admin Password?)
EditPassWdTable
Set_Orig_Secur
Set_Answer_Sec
Set_Admin_PsWd
Speaker
Make_Busy or RemoveMakeBusy
Download Code
Reset
Service_Line or DiscServLine
▲ Does not appear in Remote Mode. (Rem_Digital_Loop, Loc_Digital_Loop, and Pattern appear if the secondary channel is used.)
98-14528c-03

Result Codes B

Overview

Table B-1 lists all the result codes 3800*Plus* modems may send to the DTE. Result codes can be numeric or verbal, terse or extended. See the Q*n*, V*n*, and X*n* commands in Chapter 13, *AT Command Set and S-Registers* for more information.

Table B-1
(1 of 3)
Result Codes

Numbers (1)	Numbers (2)	Word	Description
0	0	OK	Command executed
1	1	CONNECT	Modem connected to line
2	2	RING	Modem receiving a ring voltage from the VF line
3	3	NO CARRIER	Modem lost or does not detect carrier signal, or does not detect answer tone
4	4	ERROR	Invalid command
5	5	CONNECT 1200*	Connection at 1200 bps
6	6	NO DIALTONE*	No dial tone detected
7	7	BUSY*	Busy or trunk busy signal detected
8	8	NO ANSWER*	No “quiet” answer (@)
10	10	CONNECT 2400*	Connection at 2400 bps
11	11	CONNECT 4800*	Connection at 4800 bps
12	12	CONNECT 9600*	Connection at 9600 bps
13	16	CONNECT 12000*	Connection at 12,000 bps
14	13	CONNECT 14400*	Connection at 14,400 bps
15	14	CONNECT 19200**	Connection at 19,200 bps
16	15	CONNECT 7200*	Connection at 7200 bps

Table B-1
(2 of 3)
Result Codes

Numbers (1)	Numbers (2)	Word	Description
*Appears when the Extended Result Codes configuration option is enabled. **Appears when the Extended Result Codes configuration option is set for Use_DTE_Rate. This displays the DTE data rate instead of the line rate.			
17	17	CONNECT 16800*	Connection at 16,800 bps
19	1	CONNECT 300*	Connection at 300 bps
20	10	CONNECT 2400/ EC***	Connection at 2400 bps with error control
21	11	CONNECT 4800/ EC***	Connection at 4800 bps with error control
22	12	CONNECT 9600/ EC***	Connection at 9600 bps with error control
23	16	CONNECT 12000/ EC***	Connection at 12,000 bps with error control
24	13	CONNECT 14400/ EC***	Connection at 14,400 bps with error control
25	17	CONNECT 16800/ EC***	Connection at 16,800 bps with error control
26	15	CONNECT 7200/ EC***	Connection at 7200 bps with error control
27	5	CONNECT 1200/ EC**	Connection at 1200 bps with error control
28	28	CONNECT 38400**	Connection at 38,400 bps
29	14	CONNECT 19200/ EC***	Connection at 19,200 bps with error control
30	30	CONNECT 57600**	Connection at 57,600 bps
32	32	CONNECT 76800**	Connection at 76,800 bps
34	34	CONNECT 115200**	Connection at 115,200 bps
37	37	CONNECT 21600*	Connection at 21,600 bps
38	38	CONNECT 24000*	Connection at 24,000 bps
39	39	CONNECT 26400*	Connection at 26,400 bps
40	40	CONNECT 28800*	Connection at 28,800 bps
41	41	CONNECT 31200*	Connection at 31,200 bps
42	42	CONNECT 33600*	Connection at 33,600 bps
*Appears when the Extended Result Codes configuration option is enabled. **Appears when the Extended Result Codes configuration option is set for Use_DTE_Rate. This displays the DTE data rate instead of the line rate. *** Appears when the Extended Result Codes configuration option is set for Add/EC. If this configuration option is set for Add/V42,MNP, then V42b, V42, MNP5, MNP4, MNP3, MNP2, or NoEC appears. For either suffix type, if the modulation is V.34, /RX=xxxxx/TX=xxxxx is appended showing the VF rates in both directions.			

Table B-1
(3 of 3)
Result Codes

Numbers (1)	Numbers (2)	Word	Description
43	43	CONNECT 21600/ EC***	Connection at 21,600 bps with error control
44	44	CONNECT 24000/ EC***	Connection at 24,000 bps with error control
45	45	CONNECT 26400/ EC***	Connection at 26,400 bps with error control
46	46	CONNECT 28800/ EC***	Connection at 28,800 bps with error control
47	47	CONNECT 31200/ EC***	Connection at 31,200 bps with error control
48	48	CONNECT 33600/ EC***	Connection at 33,600 bps with error control

*** Appears when the Extended Result Codes configuration option is set for Add/EC. If this configuration option is set for Add/V42,MNP, then V42b, V42, MNP5, MNP4, MNP3, MNP2, or NoEC appears. For either suffix type, if the modulation is V.34, /RX=xxxxx/TX=xxxxx is appended showing the VF rates in both directions.

This page intentionally left blank.

Troubleshooting C

Overview

Appendix B, *Result Codes*, points out basic problems that can occur when operating a 3800*Plus* modem. Use Tables C-1 through C-6 to check out these problems. If you are having data communication difficulties, such as periodic character loss, random errors, or constant format errors, use the loopback tests described in Chapter 7, *Test Branch*. With these tests you can usually isolate the fault in your system by using the process of elimination. If problems continue to occur, contact your service representative.

Table C-1
Modem Integrity

Symptom	Action
Modem did not pass power-up self-test	Contact your service representative.
Power LED does not light LCD does not display	Make sure the modem's ON/Off switch is in the ON position. Make sure the ac power transformer is connected to the ac power receptacle. If Power LED and/or LCD do not operate, contact your service representative.
A problem is suspected after the power-up self-test	Perform a self-test via the modem's DCP or type AT&T9 if using AT commands. Perform a local analog loopback with a Pattern test. If the modem consistently registers errors, contact your service representative. If the modem passes the above tests and a problem still exists, then the problem is likely not with your modem.

Table C-2
Modem – DTE Connection

Symptom	Action
Modem does not accept or echo back AT commands	Verify that the cable between the Async port of the DTE and the modem is a standard RS-232 cable. If the cable is bad, replace it. (Null modem cables, also known as crossover cables, do not work in this application.) Verify that the Command Echo Character configuration option is enabled. Refer to *Line Dialer* in Chapter 8, *Configure Branch*, or ATE command in Chapter 13, *AT Commands and S-Registers*. Verify that the DTE Dialer Type configuration option is set to AT. Refer to *DTE Dialer* in Chapter 8, or the AT&M or AT&Q command in Chapter 13. Verify that the Result Codes configuration option is enabled. Refer to *DTE Dialer* in Chapter 8, or the ATQ command in Chapter 13. Reload the Async Dial factory configuration area to guarantee that all configuration options are returned to their proper setting. Make sure that all AT commands are terminated with a carriage return. Verify that the ASCII value of a carriage return matches what is used by the DTE and the modem. Refer to *DTE Dialer* in Chapter 8 or the S3 register in Chapter 13. Verify that the DTE has a valid character format. Valid format consists of 8 data bits with no parity or 7 data bits with even, odd, mark or space parity. Verify that your equipment can support the DTE data rate. Refer to Async DTE Rate configuration option, in *DTE Interface* in Chapter 8. If using a PC, verify that the modem is attached to the correct communications port.

Table C-3
(1 of 2)
Modem – VF Connection

Symptom	Action
Modem does not receive a dial tone	Attach the telephone directly to the wall outlet to verify that a dial tone exists. Make sure the VF line is connected to the modem's rear jack labeled Dial.
Modem does not go off-hook and answer an incoming call	Verify that the Auto-Answer Ring Count configuration option (S-Register 0) is set to a value other than 0 (disable). Verify that the DTE is providing DTR to the modem. If the DTE does not provide DTR to the modem, verify that the modem's DTR Action configuration option is set for Ignore. Refer to *DTE Dialer* in Chapter 8. Verify that all cables are attached to the correct connectors on the rear of the modem.

Table C-3
(2 of 2)
Modem – VF Connection

Symptom	Action
Modem goes off-hook, answers, but does not connect	Perform a Local Analog Loopback test and verify that data entered at the DTE is echoed back to the DTE. Verify that the originating modem is compatible. Verify that originating modem recognizes your modem's answer tone. Verify that originating modem supports your modem's modulation schemes. The 3800*Plus* modem recognizes ITU-T V.34, V.32*terbo*, ITU-T V.32bis, V.32, V.22bis, V.22, V.21, Bell 212A, and Bell 103J. It does not support other vendors' proprietary modulation schemes. Force your modem to operate at the same modulation scheme as the originating modem to see if they connect.
Originate Mode	Verify that the modem's DTE Dialer configuration option is set to the correct setting: either AT, DTR Dialing, V.25bis Async, V.25bis Bisync, or V.25bis HDLC.
Modem does not go off-hook and begin dialing	If using AT Dialing, refer to Table C-2, Modem – DTE Connection. If using DTR Dialing, verify the telephone number stored in directory location 1, and verify that the DTE is raising DTR from Off to ON to initiate a dial. If using V.25bis Async, verify that the correct character format is set to 7 data bits with even parity and 1 stop bit, and the carriage return and line feed are used as command terminators. If using V.25bis Bisync, verify that the correct character format uses two synchronous control characters and a start-of-text control character before the text block and an end-of-text control character after the text block. If using V.25bis HDLC, verify that the correct character format uses flag, address, and control characters before the text block and a frame sequence check and flag after the text block.
Modem dials but does not connect	If the modem is operating behind a PBX, verify if a 9 and comma are needed before the telephone number. Verify whether Tone or Pulse dialing is needed. Verify if one modem is configured for Error Control or Disconnect and the other modem is configured for no Error Control. Try calling in Buffer mode. If both modems use V.32bis or V.32 modulation, set the modem's V.32bis Train configuration option to Long.
Intermittent disconnects, high error rates, or excessive retransmissions	Perform an End-to-End test. Refer to *Pattern* located in Chapter 7, *Test Branch*.
Modem establishes and disconnects a call	You may have a poor VF connection. Disconnect and dial again. The remote modem may have encountered an EC Disconnect, where the modem is configured to establish a call using error correction. If the modems cannot negotiate EC, then a disconnect occurs. The remote modem may be in a forced Error Control mode (disconnect if there is no error control). Reconfigure your modem to V.42/MNP or Buffer and try again. Check the LCD to verify the reason for disconnect. Perform a Local Analog Loopback test.
High error rates occur when running a local loopback or self-test	Incoming rings can cause data errors during a loopback test. Abort the test, disconnect the modular VF cord, and restart the test.

Table C-4
Online Operation

Symptom	Action
Data scrambled	Verify that the character format (data bits, parity, and stop bits) is set to the same value in both modems.
Missing data during a transfer	Verify that you are using the same method of flow control for both the modem and the DTE. If using XON/XOFF flow control, verify that the modem's parity matches the DTE's parity.

Table C-5
Leased-Line Operation

Symptom	Action
Modems do not train-up on leased lines	Verify that the correct cabling is used for your application. Refer to Chapter 2, *3810Plus Installation*. Verify that one modem is configured for Answer mode and the other is configured for Originate mode. Verify that both modems are using the same modulation scheme. Verify that modems are configured for the appropriate leased-line mode. For example, if you have a 4-wire leased line, then the modems must be configured for 4-wire operation.
Modems are configured for dial backup, but do not switch to dial lines if leased lines fail	Verify that both modems have the Auto Dial Backup configuration option enabled.

Table C-6
Dial Backup Operation

Symptom	Action
Dial backup line is present, but cannot connect	Verify that the correct telephone number for the remote modem is stored in directory location 1. Verify that one modem has the Auto Dial Backup configuration option set for Disable and the other has it set to Enable.
Modem does not switch back to leased-line operation	Verify that the Auto Dial Standby configuration option is enabled.

Technical Specifications D

Table D-1 shows the technical specifications for 3800*Plus* modems.

Table D-1
(1 of 3)
Technical Specifications for COMSPHERE 3800*Plus* Modems

Specifications	Criteria
APPROVALS (110 Vac, 60 Hz only)	
FCC Part 15	Class A
FCC Part 68	Registration Number: (See label on modem.)
UL	
3810*Plus* (Model 3980)	Listed to UL 1950
3811*Plus* (Model 3981)	Recognized to UL 1950 with COMSPHERE 3000 Series Carrier
CSA	
3810*Plus* (Model 3980)	Certified to CSA C22.2 No. 950-M89
3811*Plus* (Model 3981)	Certified as a component to CSA C22.2 No. 950-M89 with COMSPHERE 3000 Series Carrier
DOC	
3810*Plus* (Model 3980) 3811*Plus* (Model 3981)	Certification Number: (See label on modem.)

Table D-1
(2 of 3)
Technical Specifications for COMSPHERE 3800*Plus* Modems

Specifications	Criteria
COMPATIBILITY	**DIAL-LINE MODULATIONS** ITU-T V.34 (33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200, 16,800, 14,400,12,000, 9600, 7200, 4800, 2400 bps) Proprietary V.32*terbo* (19,200, 16,800 bps) ITU-T V.32bis (14,400, 12,000, 9600, 7200, 4800 bps) ITU-T V.32 (9600, 4800 bps) ITU-T V.22bis (2400 bps) ITU-T V.22 (1200 bps) ITU-T V.21 (300 bps) Bell 212A (1200 bps) Bell 103J (300 bps) **LEASED-LINE MODULATIONS** ITU-T V.34 (33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200, 16,800, 14,400, 12,000, 9600, 7200, 4800, 2400 bps) Proprietary V.32*terbo* (19,200, 16,800 bps) ITU-T V.32bis (14,400, 12,000, 9600, 7200, 4800 bps) ITU-T V.32 (9600, 4800 bps) ITU-T V.33 (14,400, 12,000 bps) (optional) ITU-T V.29 (9600, 7200, 4800 bps) (optional) ITU-T V.22bis (2400 bps) **FAX MODULATIONS** ITU-T V.17 (14,400 bps) ITU-T V.29 (9600, 7200 bps) ITU-T V.27ter (4800, 2400 bps)
DATA RATES	
Dial Line	33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200,16,800, 14,400, 12,000, 9600, 7200, 4800, 2400, 1200, or 300–0 bps
Leased Line	33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200,16,800, 14,400, 12,000, 9600, 7200, 4800, or 2400 bps
DTE RATES	115,200, 76,800, 57,600, 38,400, 28,800, 14,400, 12,000, 9600, 7200, 4800, 2400, 1200, 0–300 bps
ERROR CONTROL	ITU-T V.42 MNP 4–2
DATA COMPRESSION	ITU-T V.42bis MNP Class 5 Proprietary Synchronous Data Compression (optional)
ENVIRONMENT	
Operating Temperature	32°F (0°C) to 122°F (50°C)
Relative Humidity	5% to 90% (noncondensing)
Shock and Vibration	Withstands normal shipping
Storage Temperature	–4°F (–20°C) to 158°F (70°C)

Table D-1
(3 of 3)
Technical Specifications for COMSPHERE 3800*Plus* Modems

Specifications	Criteria
AC POWER REQUIREMENTS	
3810*Plus*	110 Vac, 50 to 60 Hz
POWER CONSUMPTION	
3810*Plus*	8 watts (typical, including power supply, speaker off)
3811*Plus*	6 watts (typical, each card) Speaker consumption is approximately 1 watt at high volume.
HEAT DISSIPATION	
3810*Plus*	27.3 BTU/Hr (typical, including power supply, speaker off)
3811*Plus*	20.5 BTU/Hr (typical, each card)
DIMENSIONS	
Weight	2.5 pounds (1.14 kg) 3810*Plus* (without power supply) 1.0 pounds (0.45 kg) 3811*Plus*
Height	2.1 inches (5.4 cm) 3810*Plus* 7.1 inches (18.1 cm) 3811*Plus*
Width	7.6 inches (19.4 cm) 3810*Plus* 1.8 inches (4.6 cm) 3811*Plus*
Depth	12.1 inches (30.8 cm) 3810*Plus* 13.4 inches (34.0 cm) 3811*Plus*
TRANSMIT LEVEL	
Dial Line	Permissive (–9 dBm), Selectable –32 dBm through –10 dBm, optional ETC 1.0, ETC 1.1
Leased Line	0 through –15 dBm (in 1 dBm decrements)
TELEPHONE INTERFACE	
Dial-Line Connectivity	
3810*Plus*	RJ11C Permissive
3811*Plus*	RJ21X Permissive 50-pin connector RJ11C Permissive Service Line
Leased-Line Connectivity	
3810*Plus*	JM8
3811*Plus*	50-pin mass termination
DTE INTERFACE	
25-pin D-subminiature connector	EIA-232-D/ITU-T V.24
VOICE FREQUENCY LINE REQUIREMENTS	2-wire dial (PSTN) or 4-wire/2-wire leased line

This page intentionally left blank.

Pin Assignments E

Appendix E lists the pin assignments for EIA-232-D and VF TELCO interfaces, and shows the wiring diagram for an 8-position to 6-position cable.

EIA-232-D Pin Assignments

Table E-1 lists the EIA-232-D pin assignments for the modem.

Table E-1
EIA-232-D Pin Assignments

RS-232 Pin	Name	EIA Circuit	ITU-T	Signal Source	Circuit Function
1	—	AA	101	—	Shield
2	TXD	BA	103	DTE	Transmit Data
3	RXD	BB	104	DCE	Receive Data
4	RTS	CA	105	DTE	Request-to-Send
5	CTS	CB	106	DCE	Clear-to-Send
6	DSR	CC	107	DCE	Data Set Ready
7	SG	AB	102	—	Signal Ground
8	LSD	CF	109	DCE	Line Signal Detect
9	+10V	—	—	—	Reserved for test purposes (may be used to drive one RS-232 load)
10	–10V	—	—	—	Reserved for test purposes (may be used to drive one RS-232 load)
11	—	—	—	—	Unassigned
12	CT112	CI	112	DCE	Data Signal Rate Select
13	—	—	—	—	Reserved for future function
14	—	—	—	—	Reserved for future function
15	TXC	DB	114	DCE	Transmit Clock
16	—	—	—	—	Reserved for future function
17	RXC	DD	115	DCE	Receive Clock
18	CT141	LL	141	DTE	Local Loopback
20	DTR	CD	108	DTE	Data Terminal Ready
21	CT140	RL	140	DTE	Remote Loopback
22	RI	CE	125	DCE	Ring Indicator
23	CT111	CH	111	DTE	Data Rate Selector
24	XTXC	DA	113	DTE	External Clock
25	TEST	TM	142	DCE	Test Mode

VF Connector Pin Assignments

Table E-2 lists the connector pin assignments for 3810*Plus* modular jacks and the pin assignments for the TELCO jacks (Figure E-1).

Table E-2
VF Connector Pin Assignments

Pin	Leased	Dial/Leased	Type of Telco Jack	
			RJ11	JM8
1	4-Wire: TX 2-Wire: TX/RX			Ring 1
2	4-Wire: TX 2-Wire: TX/RX			Tip 1
3				
4		Ring/ 2-Wire Leased	Ring	
5		Tip/ 2-wire Leased	Tip	
6				
7	4-Wire: RX			Tip
8	4-Wire: RX			Ring

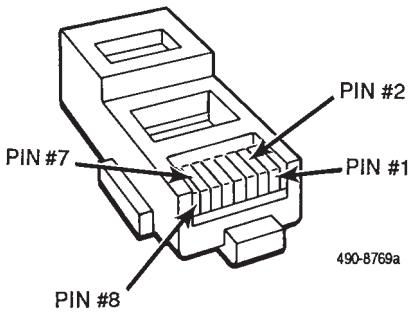


Figure E-1. VF Pin Orientation

JM8 to RJ11 Crossover Cable

For 2-wire leased-line connections to a JM8 network interface, an 8-position to 6-position crossover cable (see Figure E-2) must be used according to the following FCC requirements:

"The RJ series of jacks should not be used for connecting data equipment to nonswitched private line networks – specifically, the service equivalents of the pre-divestiture Series 3002 (Category II, Tariff #260) service. There is a substantial difference in transmit levels permitted in the private line service and those permitted in the public switched network. The industry standard is now an 8-pin keyed modular jack known as the USOC JM8 (Bellcore Technical Reference: TR-EOP-000242, Issue 1, released May 1985.) When ordering the installation of the USOC JM8, specify the appropriate wiring options:

1. 2-wire operations
2. 4-wire operations w/o TEK leads
3. 4-wire operations with TEK leads

TEK leads are for loopback purposes.

A 50-pin version is being considered for multiple line connections."

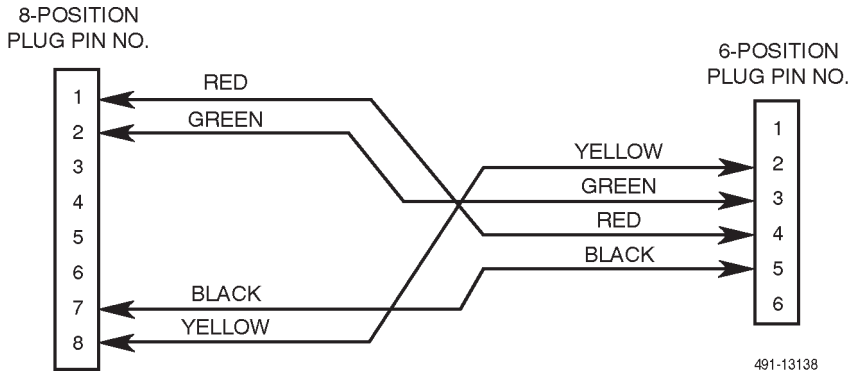


Figure E-2. Wiring Diagram — 8-Position to 6-Position Crossover Cable

ITU-T V.25bis Dialing Commands and Responses

F

Overview

ITU-T V.25bis is an international dialing protocol that permits direct and stored number dialing using DTEs in either Asynchronous, Bisynchronous, or HDLC operating mode. The 3800*Plus* modems support V.25bis request and answer commands that initiate and cancel dialing, program commands that allow you to create and enter telephone numbers to memory, and list commands that display all telephone numbers stored in directory locations. As commands are entered from the DTE, 3800*Plus* modems issue a response to the DTE which indicates if the call failed or connected, or if the command is valid or invalid.

The following section discusses those V.25bis commands supported by 3800*Plus* modems and the response to those commands.

Tables F-1 and F-2 in the *Command Response* section list the V.25bis command and response and the analogous AT command.

> **NOTE**
>
> The 3800*Plus* modem must be configured for V.25bis dialing. Refer to DTE Dialer Type configuration option in Chapter 8, *Configure Branch*.

Call Request Commands

Call Request commands are issued from the DTE to the modem and are responsible for initiating any dial calls. Call Request commands include Call Request with Number Provided (CRN) and Call Request with Stored Memory Address Provided (CRS).

Call Request with Number Provided (CRN)

The CRN command dials the telephone number entered from the DTE. CRN is similar to the ATD command.

The CRN command format is:

CRN*n*

Where: *n* is the dial string. The following characters are permitted:

T	DTMF Dialing
P	Pulse Dialing
0–9	DTMF Tones or Pulse Dialed Digits
*** # A B C D**	DTMF Tones
R	Reverse Dial
:	Wait for Dial Tone
, or <	User-Defined Pause
&	Flash Hook
= or >	Delimiters

Call Request with Stored Memory Address Provided (CRS)

The CRS command dials the telephone number stored in the request directory location. CRS is similar to the ATDS command.

The CRS command format is:

CRS*x*

Where: *x* is directory location 1–10.

The modem responds to the command with either a VAL (valid) or INV (invalid) response followed by a call progress report such as connect (CNX) or failure (CFI).

Call Response

Call Failure Indication (CFI)

The CFI response is issued to the DTE if the modem fails a CRN or CRS command. CFI is similar to the AT result codes BUSY, NO ANSWER, NO CARRIER, NO DIALTONE, and ERROR.

The CFI response format is:

CFI*xx*

Where: *xx* is one of

ET	Engaged tone
NS	Number not stored
CB	Local DCE busy
RT	Timeout on ring tone
AB	Abort call on time-out
NT	Answer tone not detected
FC	Forbidden call

ET is similar to the Call Failure Messages, Busy Signal and Trunk Busy and the result code BUSY.

NS is similar to the Common Operational Message Invalid Number and the result code ERROR.

CB is similar to the Call Failure Messages, Dial Line in Use and No Dial-Test and the result code ERROR.

RT is similar to the Call Failure Message No Answer Tone and the result code NO CARRIER.

AB is similar to the Call Failure Messages, No Dial Tone and No Dial-DTR and the result code NO DIALTONE and ERROR.

NT is similar to the Call Failure Message No Quiet Answer and the result code NO ANSWER.

Call Connecting (CNX)

The CNX response informs the DTE that the modem has connected to the remote modem. CNX is similar to the AT result code CONNECT.

The CNX response format is CNX.

Call Answer Commands

Call Answer commands disable or enable the modem's AutoAnswer function. These commands are issued from the DTE. Call Answer commands include Incoming Call (INC), Disregard Incoming Call (DIC) and Connect Incoming Call (CIC).

Incoming Call (INC)

The INC response informs the DTE that the modem has detected a ring tone. At this point, the DTE can issue the DIC command to disable the modem from answering the call. INC is similar to the AT result code RING.

Disregard Incoming Call (DIC)

The DIC command prevents the modem from answering an incoming call. This command is only valid once the DTE receives an incoming call (INC) response from the modem. A DIC must be issued within 5 seconds after receiving an INC.

The DIC command format is DIC.

If DIC is issued within 5 seconds, the modem sends the VAL response to the DTE. If DIC is issued after 5 seconds, INV is returned.

Connect Incoming Call (CIC)

The CIC command forces the modem to cancel any DIC commands and answer an incoming call. This command is only valid when the DTE issues a DIC command. CIC must be issued within 10 seconds after sending a DIC. CIC is similar to the ATA command.

The CIC command format is CIC.

If CIC is issued within 10 seconds, the modem sends the VAL response to the DTE. If CIC is issued after 10 seconds, INV is returned.

Program Normal (PRN)

The Program Normal (PRN) command allows the DTE to enter and store a telephone number to a specific directory location. PRN is similar to the AT&Z command.

The PRN command format is:

PRN*x;n*

Where: *x* is the directory location 1–10.
n is the telephone number.

Request List of Stored Numbers (RLN)

The Request List of Stored Numbers (RLN) command displays telephone numbers stored in the modem's directory location. If the RLN command is entered without specifying a directory location, then all directory locations and telephone numbers are displayed. If a directory location is entered, then only that telephone number are displayed.

The RLN command format is:

RLN

which displays all directory locations,

or

RLN*x*

Where: *x* is a directory location.

List Stored Number Response (LSN)

LSN is a response to an RLN command issued by the DTE. If a directory location is specified, then the telephone number for that location is displayed. If no directory location is specified, then all telephone numbers stored in memory are displayed.

The LSN response format is:

LSN*x;n*

Where: *x* is the directory location.
n is the telephone number.

Command Response

A Command Response indicates that the command entered was a valid or invalid entry. Command Response includes Valid (VAL) and Invalid (INV).

Valid (VAL)

The VAL response indicates that the modem has accepted the V.25bis command issued by the DTE. VAL is similar to the AT result code OK.

Invalid (INV)

The INV response indicates that the modem has received an incorrect V.25bis command from the DTE. INV is similar to the AT result code ERROR.

The INV response format is:

INV*xx*

Where: *xx* is

CU	command unknown
MS	message syntax error
PS	parameter syntax error
PV	parameter value error

Table F-1 lists V.25bis commands supported by 3800*Plus* modems.

Table F-2 lists V.25bis response messages supported by 3800*Plus* modems.

Table F-1
V.25bis Commands

V.25bis Command	Description	AT Command/ S-Register Equivalent
CALL REQUEST COMMANDS		
CRN	Call Request with Number Provided	ATD
CRS	Call Request with Memory Address	ATDS
CALL ANSWER COMMANDS		
INC	Incoming Call Indication	RING
DIC	Disregard Incoming Call	NONE
CIC	Connect Incoming Call	ATA
PROGRAM COMMAND		
PRN	Program Normal	AT&Z
LIST REQUEST		
RLN	Request to List Stored Number	NONE

Table F-2
V.25bis Response Messages

V.25bis Command	Description	AT Command/ S-Register Equivalent
CALL RESPONSE		
CFI	Call Failure Indication	BUSY, NO ANSWER, NO CARRIER, NO DIAL TONE, ERROR
CNX	Call Connecting Indication	CONNECT
LIST RESPONSE		
LSN	List Stored Number	NONE
COMMAND RESPONSE		
VAL	Valid Command	OK
INV	Invalid Command	ERROR

Default Configuration Options G

Overview

Table G-1 lists all default configuration options for the main four factory preset configurations. (Additional configuration options set by the optional Cellular (Mobile) and Cellular (PSTN) factory preset configurations are listed under the &F5 and &F6 commands in Chapter 13, *AT Command Set and S-Registers*.) An N/A indicates that the value for this configuration option does not appear on the LCD if that factory default configuration is selected.

Table G-1
(1 of 5)
Factory Default Configuration Options

Configuration Option	Async Dial and UNIX Dial Default Settings	Sync Dial Default Settings	Sync Leased Answer/ Originate Mode Default Settings
DTE INTERFACE			
Async/Sync Mode	Async	Sync	Sync
Async DTE Rate	19,200 bps	N/A	N/A
# Data Bits	8	N/A	N/A
Parity Bit	None	N/A	N/A
# Stop Bits	1	N/A	N/A
DTR Action	Ignore	Standard RS232	Ignore
DSR Control	Forced ON	Standard RS232	Standard RS232
RTS Action	Ignore	Standard RS232	Standard RS232
CTS Control	Forced On Wink When Disc[1]	Standard RS232	Standard RS232
RTS/CTS Delay	0 msec	0 msec	0 msec
LSD Control	Standard RS232 Wink When Disc[1]	Standard RS232	Standard RS232
TX Clock Source	N/A	Internal	Internal
CT111 Rate Control	Disable	Disable	Disable
DTE Rate = VF Rate	Disable	Disable	Disable

[1] UNIX Dial default setting only.

Table G-1
(2 of 5)
Factory Default Configuration Options

Configuration Option	Async Dial and UNIX Dial Default Settings	Sync Dial Default Settings	Sync Leased Answer/ Originate Mode Default Settings
DTE DIALER			
DTE Dialer Type	AT	Disable	Disable
AT Escape Character	043 ASCII	N/A	N/A
Escape Guard Time	1sec	N/A	N/A
Break Forces Escape	Disable	N/A	N/A
Command Character Echo	Enable	N/A	N/A
Carriage Return Character	013 ASCII	N/A	N/A
Backspace Character	008 ASCII	N/A	N/A
Linefeed Character	010 ASCII	N/A	N/A
Result Codes	Enable Enable In Originate[1]	N/A	N/A
Extended Result Codes	Enable	N/A	N/A
Result Codes Format	Words	N/A	N/A
V.25bis Coding	N/A	N/A	N/A
V.25bis Idle Fill	N/A	N/A	N/A
V.25bis New Line Character	N/A	N/A	N/A
AT Command Mode[2]	Normal	N/A	N/A
LINE DIALER			
Auto Answer Ring Count	1	1	1
Dialer Type	Tone	Tone	Tone
Dial Tone Detect	Enable	Enable	Enable
Blind Dial Pause	N/A	N/A	N/A
Busy Tone Detect	Enable	Enable	Enable
"," Pause Time	2 sec	2 sec	2 sec
No Answer Timeout	45 sec	45 sec	45 sec
Fast Disconnect	Disable	Disable	Disable
Long Space Disconnect	Enable	Disable	Enable
No Carrier Disconnect	5 sec	5 sec	5 sec
No Data Disconnect	60 min	60 min	60 min
Auto Make Busy (3811*Plus* only)	Disable	Disable	Disable
Make Busy via DTR	Disable	Disable	Disable
MI/MIC Dialing	Disable	Disable	Disable

[1] UNIX Dial default setting only.

[2] This configuration option is not changed by loading factory default configuration options.

Table G-1
(3 of 5)
Factory Default Configuration Options

Configuration Option	Async Dial and UNIX Dial Default Settings	Sync Dial Default Settings	Sync Leased Answer/ Originate Mode Default Settings
DIAL LINE			
Modulation	V.34	V.34	V.34
Dial Line Rate	33600(V34)	33600(V34)	33600(V34)
Automode	Enable	Enable	N/A
Autorate	Enable	Enable	Enable
Dial Transmit Level	Permissive –9 dBm	Permissive –9 dBm	Permissive –9 dBm
V.22bis Guard Tone	Disable	Disable	Disable
Train Time	Long	Long	Long
Asymmetric Rate	Enable	Enable	Enable
Fall Forward Delay	Disable	Disable	Disable
LEASED LINE			
Leased Mode	N/A	N/A	4-wire LL Answer[3] 4-wire LL Orig[4]
Modulation	N/A	N/A	V.34
Leased Line Rate	N/A	N/A	33600(V34)
Autorate	N/A	N/A	Enable
Leased Transmit Level	N/A	N/A	0 dBm
BadLn Auto Orig	N/A	N/A	Disable
Rate Auto Orig	N/A	N/A	Disable
Auto Redial	N/A	N/A	Disable
Auto Dial Standby	N/A	N/A	Disable
Carrier On Level	N/A	N/A	–43 dBm
Asymmetric rate	N/A	N/A	Enable
Fall Forward Delay	N/A	N/A	Disable

[3] Sync Leased Answer Mode default setting.

[4] Sync Leased Originate Mode default setting.

Table G-1
(4 of 5)
Factory Default Configuration Options

Configuration Option	Async Dial and UNIX Dial Default Settings	Sync Dial Default Settings	Sync Leased Answer/ Originate Mode Default Settings
V.42/MNP/BUFFER			
Error Control Mode	V.42/MNP or Buffer	N/A	N/A
V.42bis Compression	Enable	N/A	N/A
MNP5 Compression	Enable	N/A	N/A
EC Negotiate Buffer	Disable	N/A	N/A
EC Fallback Character	N/A	N/A	N/A
Flow Control of DTE	CTS to DTE	N/A	N/A
Flow Control of Modem	Disable	N/A	N/A
XON/XOFF Passthrough	N/A	N/A	N/A
Modem-to-Modem Flow Control	Disable	N/A	N/A
Break Buffer Control	Keep Data	N/A	N/A
Send Break Control	Data First	N/A	N/A
TX Buffer Disconnect Delay	10 seconds	N/A	N/A
RX Buffer Disconnect Delay	Disable	N/A	N/A
Maximum Frame Size	256	N/A	N/A
Buffer Size in Buffer Mode	Normal	N/A	N/A
TESTS			
DTE RL (CT140)	Disable	Disable	Disable
DTE LL (CT141)	Disable	Disable	Disable
Test Timeout	Disable	Disable	Disable
Receive Remote Loopback	Enable	Enable	Enable
V.54 Address	Disable	Disable	Disable
V.54 Device Type	N/A	N/A	N/A
MISC			
Straps When Disconnect[2]	No Change	No Change	No Change
Speaker Control	On Until Carrier	On Until Carrier	On Until Carrier
Speaker Volume	Medium	Medium	Medium
Access from Remote[2]	Enable	Enable	Enable
Remote Access Password[2]	00000000	00000000	00000000
Directory Location #1 Callback	Disable	Disable	Disable
Network Management Address[2]	256	256	256
NMS Call Messages[2]	Call Connect & Progress	Call Connect & Progress	Call Connect & Progress
NMS DTR Alarm[2]	Disable	Disable	Disable
Network Position	N/A	N/A	Tributary Control[5]

[2] This configuration option is not changed by loading factory default configuration options.

[5] 3811*Plus* default setting.

Table G-1
(5 of 5)
Factory Default Configuration Options

Configuration Option	Async Dial and UNIX Dial Default Settings	Sync Dial Default Settings	Sync Leased Answer/ Originate Mode Default Settings
SECURITY			
Entry Wait Time[2]	20 sec	20 sec	20 sec
VF Prompt Type[2]	2nd Dial Tone	2nd Dial Tone	2nd Dial Tone
DTE Password Tries[2]	1	1	1
DTE Password Termination Character[2]	013 ASCII	013 ASCII	013 ASCII
Password Backspace Character[2]	008 ASCII	008 ASCII	008 ASCII
Answer Security Mode[2]	No_Answ_Sec	No_Answ_Sec	No_Answ_Sec
Originate Security Mode[2]	No_OrigSec	No_OrigSec	No_OrigSec

[2] This configuration option is not changed by loading factory default configuration options.

This page intentionally left blank.

Equipment List H

Equipment	Feature/Part Number
Model 3810*Plus* (110 v)	3980-A2-201
Model 3811*Plus*	3981-B1-001
V.29 Feature	3980-C1-002
V.33 Feature	3980-C1-003
Expanded Security Feature (for 3811*Plus* modems only)	3980-C1-004
Synchronous Data Compression (SDC) Feature	3980-F1-700
Enhanced Throughput Cellular (ETC) Feature	3981-C1-010
User's Guide	3980-M1-001
6-position, 4-wire modular cord, 7-foot length	125-0067-0031
8-position, 8-wire modular cord, 14-foot length	125-0053-1431
8-position to 6-position (JM8 to RJ11) crossover modular cable	125-0054-1531
Power Supply (110 v)	327-0073-0131

This page intentionally left blank.

Synchronous Data Compression

Overview

The Paradyne proprietary Synchronous Data Compression (SDC) feature allows an increase of throughput in data transmission, and has an error correcting procedure so that transmitted data is less sensitive to channel disturbances.

The ITU-T recommendations V.42bis and V.42 have data compression and error correcting (EC) procedures for DCEs connected to asynchronous DTEs. These procedures form the basis of Paradyne's SDC feature.

With the SDC feature, two DTEs can exchange data via a synchronous protocol while the DCE provides the new synchronous data compression and error correction functions. The synchronous data from the local DTE, after compression, is inserted into DCE frames which are sent to the remote DCE. Inverse operations then occur at the remote DCE.

SDC can be used with V.34 and V.32 family modulations on dial or leased lines, and in a dial backup or standby mode.

Synchronous Data Format

The SDC feature supports the High-level Data Link Control (HDLC) and Synchronous Data Link Control (SDLC) type protocols for synchronous DTE data. An HDLC frame is composed of an information field containing the data to transmit, plus an overhead (address, control, and FCS fields) used by the DTE protocol. Flags opening and closing the HDLC frame serve as frame delimiters.

A 3800*Plus* modem with the SDC feature supports DTE frame sizes up to 4300 bytes. This conforms to the X.25 recommendation which defines a maximum size of data packets as equal to 4096 bytes.

If the modem has the SDC Delay Min configuration option set to Rx_Clock, there is no limitation on the DTE frame size for the DTE frames transmitted from the remote modem to this local modem, since the whole frame need not be buffered.

The SyncDTE CRC configuration option determines whether the CRC of the DTE frame (the FCS field) is transmitted. If the CRC type is known to be the 16-bit CRC for HDLC frames as defined by ITU-T (generator polynomial $x^{16} + x^{12} + x^5 + 1$), the CRC can be removed by the local modem and added to the DTE frame by the remote modem.

SDC Algorithm

The compression algorithm is based on V.42bis British Telecom Lempel ZIV (BLTZ).

DTE and DCE Frames

Data exchanged between the local and remote DCEs is according to the LAPM protocol. The structure of a LAPM frame (DCE frame) is identical to the HDLC frame. The data from the DTE is compressed into the information field of the DCE frame. After compression, one DTE frame is segmented into one or several DCE frames.

Data Synchronization

Data exchanged between the synchronous DTE and the modem is synchronized by two clock signals. Data coming from the DTE is synchronized by the transmit clock and data received by the DTE is synchronized by the receive clock. The transmit clock is provided by the modem on circuit 114 or by the synchronous DTE on circuit 113. The receive clock is provided by the modem on circuit 115.

When the transmit clock is provided by the modem, the transmit and receive clocks are locked on the same clock source internal to the modem. In this configuration, the user can select rates on the DTE-DCE line (or clock frequencies) in the range from 1.2 kHz to 128 kHz.

When the transmit clock is provided by the DTE, the receive clock is set by the modem equal to the DTE clock. When SDC is in use, the Tx Clock Source configuration option cannot be set to Receiver Clock Loop.

NOTE

When faster speeds are used (above 57.6 kHz), and the transmit clock is provided by the modem, data transmission can be sensitive to DTE cable length and capacitance, as well as the DTE's drivers and receivers. Should you encounter bit errors related to the above conditions, you may want to change the Tx Clock Source configuration option setting to External (provided the DTE can support the required transmit clock signal) or change the length of the DTE cable.

Flow Control Method

The data transmitted from the DTE is sent to the DCE at a rate determined by the transmit clock frequency. When SDC is active, this data is then compressed in the DCE and sent to the remote DCE at the line rate less than the rate between the DTE and DCE (usually twice, three, or four times less). If the data sent by the DTE is not compressible, or bad line conditions cause retransmissions between the two DCEs, then the transmitting DCE must indicate to the transmitting DTE its temporary inability to accept more data; this is flow control. Flow control is also required in Buffer mode since the DTE rate and line rate can be different.

Three methods are used to control the DTE flow:

- Hardware signal CTS (circuit 106).
- Transmit clock (circuit 114). If the transmit clock is clamped, then the DTE stops sending data. This method only works when the transmit clock is provided by the modem.
- Natural flow control. Some DTEs can only send a limited number of information frames without any acknowledgment from the remote DTE. This number is the acknowledgment window size. If the DCE buffers this number of DTE frames, it will not receive another DTE frame. This is equivalent to the SyncFlowControl configuration option being set to None.

SDC Negotiation

The use of SDC and the values of the associated parameters are negotiated at link establishment via a protocol. The three associated parameters have the same meaning as those used for asynchronous data compression:

- Dictionary size parameter
- Maximum string length parameter
- Data compression request parameter

The SDC Negotiation configuration option determines how two modems connect when one or both modems have SDC enabled. Two settings are available in the SDC Negotiation configuration option: LAPM_Buffer and LAPM_Discon.

Table I-1 shows the six possible SDC Negotiation configuration scenarios.

Monitoring SDC Performance

If SDC is enabled, six performance measurements related to SDC can be displayed on the DCP. These measurements are available in the SDC submenu of the Status branch and are divided into two groups: TX (transmit) measurements and RX (receive) measurements.

Both groups have DTE Rate, Compression Ratio, and Line Efficiency measurements. Each measurement is an average of the last ten seconds' data, and is updated every second. See Table I-2.

Table I-1
SDC Negotiation Configuration Scenarios

Originating Modem	Answering Modem	Negotiation Results
SDC enabled with LAPM_Buffer negotiation.	SDC enabled.	SDC connection.
SDC enabled with LAPM_Discon negotiation.	SDC enabled.	SDC connection.
SDC enabled with LAPM_Buffer negotiation.	SDC disabled.	Buffer mode connection.*
SDC enabled with LAPM_Discon negotiation.	SDC disabled.	Disconnect.**
SDC disabled.	SDC enabled with LAPM_Buffer negotiation.	Buffer mode connection.*
SDC disabled.	SDC enabled with LAPM_Discon negotiation.	Disconnect.***

* If during the negotiation phase, the modem with SDC enabled receives data from the remote modem indicating that it has SDC disabled, the link will not be established between the two modems. For example, the link will not be established if the remote modem is configured for Async mode with an EC mode of V42/MNPorBfr, V42/MNPorDsc, LAPM_Buffer, or LAPM_Discon.

** On a leased line, the originating modem sends an endless EC negotiation sequence with the SDC request parameter. Data cannot be successfully transmitted.

*** On a leased line, the answering modem waits indefinitely for an EC negotiation sequence with an SDC request parameter. Data cannot be successfully transmitted.

Table I-2
SDC Performance Measurements

Group	DTE Rate	Compression Ratio	Line Efficiency
TX	The number of bits per second received from the DTE. This number takes into account only the data between the opening and closing flags of the HDLC frames. Flags and DTE interframe time fill are ignored.	The ratio between the number of bits in the input and output of the compression algorithm. The calculation does not include the overhead of the LAPM frame or the DTE flags and DTE interframe time fill.	The ratio between the number of bits per second sent on the line, and the line rate. The calculation does not include the DCE interframe time fill.
RX	The number of bits per second sent to the DTE. This number takes into account only the data between the opening and closing flags of the HDLC frames. Flags and DTE interframe time fill are ignored.	The ratio between the number of bits in the output and input of the decompression algorithm. The calculation does not include the overhead of the LAPM frame or the DTE flags and DTE interframe time fill.	The ratio between the number of bits per second received from the line, and the line rate. The calculation does not include the DCE interframe time fill.

Tuning SDC Efficiency

SDC efficiency is dependent on the configuration parameters of the DTE and the modem.

DTE Configuration

The way DTE parameters are changed, and whether they can be changed, depends on your DTE. See the documentation that came with your DTE.

DTE rate configuration parameter. The nominal DTE rate (the Tx/Rx clock's frequency at the DTE/DCE interface) can be a bottleneck. Increase the nominal DTE rate:

- If the DTE rate measurement reported by your modem is close to the nominal DTE rate.
- If the Line Efficiency measurement reported by your modem is substantially less than 100 percent.
- If the ratio between the nominal DTE rate and the line rate is less than the Compression Ratio.

DTE acknowledgment window size configuration parameter. This is the number of information frames the DTE will send without awaiting positive acknowledgment. Increase the DTE acknowledgment window size if your modem reports a low DTE rate and a comparatively high Compression Ratio (and therefore a Line Efficiency measurement substantially less than 100 percent). Set it to the maximum possible value.

DTE frame size configuration parameter. If SDC modems are used between synchronous DTEs, then the DCE frame size (and not the DTE frame size) must take into account the line error rate. Set the DTE frame size to as large a value as your DTE and your DTE application can handle. This reduces the significance of DTE frame overhead, and reduces the delay (expressed in number of DTE frames) for positive acknowledgment.

Modem Configuration

There are also configuration options in the V42/MNP/Buffer branch of the 3800*Plus* modem which affect SDC efficiency.

(LAPM) Max Frame Size. Except in environments where line impairments are known to be unusually high, set this to the maximum (256).

Sync DTE CRC. If the CRC type of the DTE frame is the 16-bit CRC for HDLC frames as defined by ITU-T, set this to CRC16.

SDC Delay Min. If clamping of the receive clock (circuit 115) is accepted by your DTE, then set this to Rx_Clock.

Sync Flow Cntrl. The Tx_Clock selection is suitable for most synchronous DTEs. If your DTE interprets transmit clock clamping or a drop in CTS as a problem (resulting in an aborted frame), set Sync Flow Cntl to None. Selecting None should not be a problem if the entire acknowledgment window of DTE frames does not exceed 5 kilobytes, so that it can be buffered by the modem.

Glossary

Active (Operating) A configuration area containing configuration options currently in use by the modem. When a power cycle occurs, a reset is performed, or a save is issued using the DCP, this area is updated with the contents of Active (Saved).

Active (Saved) A nonvolatile configuration area containing the most recently saved configuration options. Any changes made to configuration options can be saved using either the DCP's Save command or by issuing an AT&W0 command.

analog loop A test in which the modem's transmit VF signal is looped to its receiver.

analog signal A type of signal composed of continuously variable values, used to transmit voice or data over telephone lines.

Answer mode The state of a modem that is ready to receive an incoming call.

ASCII American Standard Code for Information Interchange. The standard for data transmission over telephone lines. A 7-bit code establishes compatibility between data services. The ASCII code consists of 32 control characters (nondisplayed) and 96 displayed characters.

Async Dial A factory-preset configuration area containing the configuration options most often used in asynchronous dial networks.

asynchronous transmission Data transmission that is synchronized by a transmission start bit at the beginning of a character (five to eight bits) and one or more stop bits at the end.

AT command mode The idle state prior to the device establishing a successful connection with a remote device. It is from the AT Command mode that AT Commands are issued.

AT command set A group of commands, issued from an asynchronous DTE, that allow control of the modem while in Command mode. All commands must begin with the characters AT and end with a carriage return.

AT command string Several AT commands issued at once. The string is preceded by an AT prefix.

autobaud The mode in which the device automatically determines the asynchronous DTE data rate.

automatic answer A capability to respond to a call received over a dial line.

automatic dial backup When leased-line operation fails, this function forces the modem to dial the telephone number stored in directory location 1; communication over the dial network continues with the remote device.

automatic dial standby When operating in Dial Backup mode, this function forces the modem to periodically check the quality of the leased line. If the leased line is found to be at normal operating condition, the modem disconnects from the dial network and continues normal operation over the leased-line network.

autorate	To adjust to varying VF line conditions by changing the data rate to a higher or lower rate after connection. The lowest rate the modem autorates to is 4800 bps; the highest possible rate depends on the modulation the modems connected with. In V.34, the modems may autorate asymmetrically.
backplane	A common bus at the rear of a nest or chassis that provides communications and power to circuit card slots.
baud	A unit of signaling speed that is equal to the number of symbols per second. This is not necessarily the same as bits per second, although the terms are frequently interchanged.
bis	Latin for *twice*. Used to distinguish the second version of a standard from other versions; e.g., V.32bis.
bisync	Binary synchronous communications. An IBM communications protocol that has become an industry standard. It uses a defined set of control characters and control-character sequences for synchronized transmission of binary-coded data between stations in a data communications system.
bit	Binary digit. The smallest unit of information, representing a choice between a one or a zero (sometimes called mark or space).
bps	Bits per second. Indicates the speed at which bits are transmitted across a data connection.
buffer	A temporary storage area used to compensate for differences in data flow rate when transmitting data from one device to another.
byte	A sequence of successive bits (usually eight) handled as a unit in data transmission.
Call Setup	Top-Level menu branch that contains all the functions necessary to dial telephone numbers stored in directory locations, answer incoming calls, disconnect calls, and save telephone numbers to directory locations.
carrier	The rack mounting that contains 17 slots: 1 control slot and 16 device slots.
carrier-mounted	A device that is designed for installation in a COMSPHERE 3000 Series Carrier and used at central-site operations. Up to 16 devices can be installed per carrier, with six carriers per cabinet.
CCITT	Consultative Committee on International Telegraphy and Telephony. An advisory committee established by the United Nations to recommend communications standards and policies. It was renamed ITU in March 1993.
character	A letter, figure, number, punctuation, or other symbol.
character echo	A way to check the accuracy of data transmission by sending (displaying) all the characters being transmitted to the monitor.
circuit pack lock	A screw lock tab installed over a circuit card's latch release tab to prevent the unit from being removed without a tool.
Class 1 fax	A fax modem standard. Under Class 1 computer software handles most of the protocol, compression, and conversion tasks.
Class 2 fax	A fax modem standard. Under Class 2 the modem handles most of the protocol, compression, and conversion tasks as well as modulation, leaving the computer free for other work.
Command mode	One of two modem operating modes. When in Command mode, the modem accepts commands instead of transmitting or receiving data.
configuration area	One of five areas within the Configure branch containing modem settings. Configuration areas include Active (Operating), Active (Saved), Customer 1, Customer 2, and Factory.
configuration option	Device software that sets specific operating parameters for the device. Sometimes referred to as straps.
Configure	Top-Level menu branch that contains all the device's configuration options.

connector	An outlet on equipment and cables that provides a connection.
CPU	Central Processing Unit. The main or only computing device in a data processing system.
CSA	Canadian Standards Association.
CTS	Clear To Send. A signal indicating that the device is ready for the DTE to transmit data. Usually occurs in response to Request To Send (RTS).
Customer 1	A user-defined configuration area containing customized configuration options for a specific application.
Customer 2	A user-defined configuration area containing customized configuration options for a specific application.
data bank	An area within the modem used to store the modem's firmware.
data carrier	A continuous frequency signal that can be modulated by another signal that contains information to be transmitted.
data compression	The elimination of empty fields, redundancies, and gaps in order to reduce storage capacity needs and the amount of data to be transmitted. Anything that is compressed is restored after the data is received.
Data mode	One of two general operating modes; the other is Command mode. When in Data mode, the modem considers any input from the computer to be data and transmits it across the telephone line to the remote modem.
DB25 connector	A 25-position connector used on cables or devices.
dBm	A decibel referenced to one milliwatt into 600 ohms. This unit measures relative signal power.
DCE	Data Communications Equipment. The equipment that provides the functions required to establish, maintain, and end a connection. It also provides the signal conversion required for communication between the DTE and the network.
DCP	Diagnostic Control Panel. The front panel of a device that continuously provides status information about the device's operation and allows an operator to manage its operation. A generic term used for both the standalone and carrier-mounted models.
demodulation	The process of recovering data from a modulated carrier wave.
dial command modifiers	A modifier used in the dial string that instructs the modem how to process a dialed telephone number.
dial line	A communications circuit that is established by a switched circuit connection in the dial network.
dial network	See PSTN.
dial string	A series of characters that consists of numbers and modifiers used to dial a telephone number.
directory location	Nonvolatile memory that stores up to ten telephone numbers. Each directory location can have up to 40 characters entered.
DOC	Canadian Department of Communication.
download	A process that transfers device firmware and software from a locally-attached PC to a device, or allows the duplication of firmware and software from a local device to a remote device.
DSR	Data Set Ready. A signal from the modem to the DTE that indicates the modem is turned ON and connected to the DTE.
DTE	Data Terminal Equipment. The equipment, such as a computer or terminal, that provides data in the form of digital signals for transmission.

DTR	Data Terminal Ready. A signal from the DTE to the modem, sent via Pin 20 of the EIA-232 interface (V.24 circuit 108/1, /2), that indicates the DTE is turned ON and connected to the modem.
edit area	A temporary work area used to view and change configuration options from the DCP without impacting modem operation. The edit area can be loaded from one of five configuration option areas: Active (Operating), Active (Saved), Customer 1, Customer 2, or Factory.
EIA	Electronic Industries Association. This organization provides standards for the data communications industry to ensure uniformity of interface between DTEs and DCEs.
EPROM	Erasable Programmable Read-Only Memory.
error control	An algorithm used to detect and correct data transmission errors.
escape sequence	Default setting is +++. This sequence lets you switch your modem from Data mode to Command mode.
ETC	Enhanced Throughput Cellular. A proprietary analog cellular transmission protocol.
extended result codes	An asynchronous message (in either numbers or words) that includes VF data rate and error control information that the modem sends to the DTE after executing or trying to execute a command.
factory defaults	A predetermined set of configuration options containing the optimum settings for operation on asynchronous dial networks.
fax modem	A modem capable of emulating some features of a fax machine. Working under the control of fax software, a fax modem can communicate with a fax machine or with another fax modem.
fax software	A program or system of programs installed on a computer that allows a fax modem to send and receive facsimile images.
FCC	Federal Communications Commission. The Board of Commissioners that regulates all electrical communications that originate in the United States.
flow control	A process in which devices stop and start the flow of data in a network to avoid losing data.
front panel	The portion of a device that continuously provides status information about the device's operation and allows an operator to manage its operation. A generic term used for both the standalone and carrier-mounted models.
full-duplex	The capability to transmit in two directions simultaneously.
function key	One of three keys on the DCP that allows you to select or scroll to an LCD entry. Function keys are labeled F1, F2, and F3.
Group III	A fax standard that specifies a rate of transmission of about one page per minute.
half duplex	The capability to transmit in two directions, but not simultaneously.
handshaking	The exchange of predetermined codes and signals (tones) to establish a connection between two modems. During handshaking the modems determine the modulation, rate, and type of error control they will use.
hidden choice indicator	A symbol appearing in the upper right-hand corner of the LCD, indicating that more selections are available than what appears on the LCD.
host	A computer attached to a network that shares its information and devices with the rest of the network.
Hz	Hertz. A unit of frequency that equals one cycle per second.
identity	Information about a particular data communications device, including the serial number, model number and software version number.

ITU-T	The Telecommunications Standardization Sector of the International Telecommunications Union, an advisory committee established by the United Nations to recommend communications standards and policies. Before March 1993 it was called CCITT.
JM8	A jack used for leased-line networks. Pins 1 and 2 are the transmit pair and Pins 7 and 8 are the receive pair.
kB	Kilobyte or kilobytes. One kilobyte is usually taken to be 1,024 bytes.
kbps	Kilobits per second. One kilobit is usually taken to be 1,024 bits.
keypad	A set of seven keys surrounding the DCP's LCD. These keys are used to select configuration options and to maneuver through the DCP menu.
LCD	Liquid Crystal Display. Thin glass plates containing liquid crystal material. When voltage is applied, the amount of light able to pass through the glass plates is altered so that messages can be displayed.
leased line	A private line connection exclusively for the user. No dialing is necessary.
LED	Light Emitting Diode. A light or status indicator that glows in response to the presence of a certain condition (e.g., an alarm).
local analog loopback	A test in which the modem's transmit voice frequency (VF) signal is looped to its receiver.
long space disconnect	A disconnect effected when the modem receives an extended space from a remote modem. When a modem is commanded to disconnect, it transmits a continuous space to the opposite modem before disconnecting.
loopback	A diagnostic procedure that sends a test message back to its origination point. Used to test various portions of a data link in order to isolate an equipment or data line problem.
LSD	Line Signal Detect. A signal between the DTE and the device indicating energy exists on the transmission circuit.
menu tree	The structure containing the menu hierarchy starting at a Top-Level menu and extending down to various device functions.
MNP	Microcom Networking Protocol. Levels 2-4 of this protocol, similar to ITU V.42, detect and correct data errors caused by telephone line noise and signal distortion. Level 5, similar to ITU V.42bis, includes data compression.
modem	MOdulator/DEModulator. A device used to convert data from a digital signal to an analog signal so that data can be transmitted over a telephone line. Once the data is received, the analog signal is converted back into a digital signal.
modem modulation	A set of guidelines that determines how the modems connect and at what speed they communicate. Modulations, such as V.32bis, V.32, V.22bis, V.22, Bell 212A, and Bell 103, have a maximum and minimum data rate. See also data rate.
modulation	The process of varying some characteristics (usually amplitude, frequency, and/or phase) of a carrier wave to form data transmissions.
network	A configuration of data processing devices used for information exchange.
NIM	Network Interface Module. The interface provided for the public switched telephone network (PSTN). There are two NIMs per carrier.
NMS	Network Management System. A computer system used for monitoring and controlling network devices.
off-hook	The state of a telephone or modem that is connected to the network.
offline	The state of a modem that is not connected to another modem.
on-hook	The state of a telephone or modem that is not connected to the network.

online	The state of a modem that is connected to and communicating with another modem.
Originate mode	The modem is in a state where it is ready to transmit a call. In a dial network, it is the modem that makes the call. In a leased-line network, it is one of two sides of the network that is selected to be the originating modem.
parity	A way of checking data accuracy by counting the number of bits that have a value of one.
PBX	Private Branch Exchange. Telephone switching equipment dedicated to one customer. A PBX connects private telephones to each other and to the public dial network.
PC	Personal Computer.
permissive interface	A dial modem operating mode characterized by a fixed output power level of –9 dBm. It is one of two possible modes of operation for modems connected to dial lines (see programmable interface).
POTS	Plain Old Telephone Service. Standard telephone service over the PSTN, with an analog bandwidth of less than 4 KHz.
power-up self-test	A test that checks most hardware components when power is applied to the device or a reset is initiated.
product code	A three-digit code indicating the modem's highest VF data rate.
programmable interface	A dial modem operating mode characterized by an output power level (–12 to 0 dBm) set by a programming resistor in the jack. It is one of two possible modes of operation for modems connected to dial lines (see permissive interface).
PSTN	Public Switched Telephone Network. A network shared among many users who can use telephones to establish connections between two points. Also known as dial network.
pulse dialing	One of two dialing methods in which telephone numbers are sent as pulses (brief changes in voltage or current intensity) across the telephone line. Rotary telephones use pulse dialing.
register	A part of the device's memory that holds stored values.
remote	Files, devices, and users not attached to your local DTE.
remote loopback	A test that sends a signal to the remote modem to test the local modem, the remote modem, and the circuit between them.
remote mode indicator	An inverse video symbol that indicates the modems are operating in Remote mode.
reset	An initialization of the device that occurs at power-up or in response to a reset command.
result code	An asynchronous message (in either numbers or words) that the device sends to the DTE after executing or trying to execute a command.
RJ11C	A type of 6-position jack normally used with permissive dial networks and telephone sets.
RJ21X	A type of 50-position jack normally used with permissive dial networks providing the appropriate conductors for up to eight telephone lines.
rotary	A telephone company service whereby multiple lines to a customer site share a common telephone number.
RS-232-D	An Electronic Industries Association's standard defining the 25-position interface between data terminal equipment and data communications equipment.
RTS	Request to Send. A signal from the DTE to the device, indicating that the DTE has data to send. V.24 circuit 105.
SDC	Synchronous Data Compression. A proprietary compression and error correction protocol.

SDCP	Shared Diagnostic Control Panel. A feature that allows carrier-mounted devices to share the same diagnostic control panel.
SDU	Shared Diagnostic Unit. A circuit card installed in Slot 0 of the COMSPHERE 3000 Series Carrier that provides an interface between an optional SDCP or network management system and the devices in the carrier.
Select key	An SDCP key that allows the selection of a specific card slot in the COMSPHERE 3000 Series Carrier.
self-test	A test that checks most hardware components when power is applied to the device or a reset is initiated.
serial transmission	A way of transmitting data in which bits are sent sequentially one at a time.
Sync Dial	A factory-preset configuration area containing configuration options most often used in synchronous dial networks.
synchronous	Concurrent, such as a data transmission synchronized by a time signal that accompanies the data.
synchronous data	Data transmission that is synchronized by timing signals. Characters are sent at a fixed rate.
synchronous transmission	Transmission in which the data characters and bits are transmitted at a fixed rate with transmitter and receiver synchronized. This eliminates the need for start and stop bits as used in asynchronous transmission, and is thus faster and more efficient.
ter	Latin for *thrice*. Used to denote the third version of a standard or recommendation, as in V.27ter.
throughput	Amount of data, or the number of data units per units of time, that pass through the network when it is operating a peak capacity.
Top-Level menu	The starting point of the menu tree that displays second-level menu branches.
training	A process where two modems try to establish a connection over the telephone (voice frequency) line.
UNIX	An operating system developed at AT&T Bell Laboratories and since used as the basis of similar operating systems.
UNIX Dial	A factory-preset configuration area containing the configuration options most often used in a UNIX dial network.
USOC	Universal Service Ordering Codes. Generic telephone company service ordering codes.
V.17	An ITU-T fax communications standard for devices operating half-duplex with synchronous data at 14,400 bps.
V.22	An ITU-T standard for modems operating full-duplex with asynchronous or synchronous data at 1200 bps over the dial network (PSTN).
V.22bis	An ITU-T standard for modems operating full-duplex with asynchronous or synchronous data at 1200 or 2400 bps over the dial network (PSTN).
V.27bis	An ITU-T communications standard for modems operating in synchronous mode at 4800 or 2400 bps.
V.27ter	An ITU-T fax communications standard for modems operating half-duplex with synchronous data at 2400 and 4800 bps.
V.29	An ITU-T communications standard for modems operating half-duplex with synchronous data at 7200 and 9600 bps.
V.32	An ITU-T standard for modems operating full-duplex with asynchronous or synchronous data at 4800 or 9600 bps on switched (dial) or leased telephone lines.

V.32bis	An ITU-T standard for modems operating full-duplex with asynchronous or synchronous data over dial networks (PSTN) or leased lines at 14,400, 12,000, 9600, 7200, or 4800 bps.
V.32*terbo*	A modulation that adds the 19,200 bps and 16,800 bps data rates to the V.32bis data rates. It is a proprietary modulation, not an ITU-T standard.
V.33	An ITU-T standard for devices operating half-duplex with synchronous data at 14,400 and 12,000 bps.
V.34	An ITU-T standard for modems operating full-duplex with asynchronous or synchronous data over leased lines or dial networks at 33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200, 16,800, 14,400, 12,000, 9600, 7200, 4800, 2400 bps.
V.42	An ITU-T standard for error control protocol.
V.42bis	An ITU-T standard for data compression.
V.42t	A proprietary Synchronous Data Compression and error correction technique.
V.54	An ITU-T standard for local and remote diagnostic loopback tests.
VF	Voice Frequency. The part of the audio frequency range used to transmit voice sound (usually 300 Hz to 3400 Hz). This band is used by the modem for its modulated signal.
XOFF	A character that tells the DTE or modem to stop transmitting data.
XON	A character that tells the DTE or modem to start or resume transmitting data.

Index

A

A/ (Repeat Last Command), 13-3
Abort (Test branch), 7-2
ac power
  connection, 2-4
  requirements, D-3
Access from Remote, 8-44
Active (Operating) configuration area, 8-1
Active (Saved) configuration area, 8-1
Administrative Password, 11-4, 11-10
Answer, 5-3
Answer Access security, 11-2
Answer Access Security Mode, 8-47
Answer Security, 11-8
any–key abort, 5-2, 13-4, 13-5
Asymmetric Rate Mode
  Dial Line, 13-20
  Leased Line, 13-20
Async DTE Rate, 8-7
AT Command Mode, 8-18
AT commands
  “H (V.42bis Compression), 8-36, 13-17
  ”L (Disconnect at 300 bps), 13-17
  &C (LSD Control), 8-12, 13-8
  &D (DTR Action), 13-8
  &F (Factory Defaults), 13-9
  &G (V.22bis Guard Tone), 8-26, 13-9
  &I (Dial Transmit Level), 13-10
  &J (Dial Transmit Type), 8-26, 13-10
  &L (Leased Mode), 8-28, 13-10
  &M (Async/Sync Mode and DTE Dialer Type), 8-7, 8-14, 13-11
  &Q (Async/Sync Mode and DTE Dialer Type), 8-7, 8-14, 13-11
  &R (RTS Action), 8-11, 13-11
  &S (DSR Control), 8-10, 13-11
  &T (Test), 13-12
  &T0 (Abort Test), 7-2
  &T1 (Local Analog Loopback), 7-3
  &T2 (Pattern Test), 7-7
  &T3 (Local Digital Loopback), 7-5
  &T4, &T5 (Receive Remote Loopback Response), 8-41
  &T6 (Remote Digital Loopback), 7-4
  &T9 (Self-Test), 7-2
  &V (View Configuration Options), 13-12
  &W (Save to Memory), 13-12
  &X (Transmit Clock Source), 8-13, 13-12
  &Z (Store Telephone Numbers), 5-5, 13-12
  %A (Error Control Fallback Character), 8-37, 13-14
  %C (MNP5 Compression), 8-36, 13-15
  +FCLASS (Service Class Selection), 13-8
  \A (Maximum Frame Size), 8-40, 13-13
  \C (Error Control Negotiate Buffer), 8-36, 13-13
  \D (CTS Control), 8-11, 13-13
  \G (Modem-to-Modem Flow Control), 8-38, 13-13
  \K (Break Buffer Control, Send Break Control, Break Forces Escape), 8-15, 8-38, 8-39, 13-13
  \N (Error Control Mode), 8-33, 13-13
  \Q (Flow Control of DTE, Flow Control of Modem), 8-37, 13-14
  \T (No Data Disconnect Timer), 8-21, 13-14
  \X (XON/XOFF Passthrough), 8-38, 13-14
  A (Answer Mode), 5-3, 13-3
  D (Dial), 5-6, 13-4
  DS (Dial Stored Number), 5-2, 13-5
  E (Command Character Echo), 8-15, 13-5
  echo, C-2
  format, 13-2
  H (Hook Switch Control), 5-3, 13-5
  I (Identification), 6-3, 13-5
  L (Speaker Volume), 8-44, 13-5
  list of, 13-2
  M (Speaker Control), 8-43, 13-5
  O (Online mode), 13-5
  Q (Result Codes), 8-16, 13-6
  Sr? (Display S-Register Value), 13-6
  Sr=n (Change S-Register), 13-6
  using to change factory presets, 4-11
  V (Result Codes Format), 8-17, 13-6
  X (Extended Result Codes, Dial Tone Detect, Busy Tone Detect), 8-16, 8-19, 8-20, 13-7
  Y (Long Space Disconnect), 8-21, 13-7
  Z (Reset and Load Active), 13-7
AT Escape Character, 8-15
Auto Dial Standby, 8-31
Auto Redial, 8-31, 13-23
  S35, 13-22
Auto-Answer Ring Count, 8-19
Automatic Firmware Download Center, 9-6
Automatic Make Busy, 8-22
automatic redialing, 8-18, 8-23, 8-31, 13-23
Automode (Dial Line), 8-25, 13-29
Autorate (Dial Line), 8-25, 13-29
Autorate (Leased Line), 8-29, 13-30

B

Backspace Character, 8-16
Bad Lines Auto Originate, 8-30
Bell Mode, 13-3
Blind Dial Pause, 8-19
Break Buffer Control, 8-38
Break Forces Escape, 8-15
Buffer Size in Buffer Mode, 8-40
Busy Tone Detect, 8-20

C

cables
  auxiliary, E-4
  crossover, E-4
Call Answer commands (V.25bis), F-2
Call Request commands (V.25bis), F-1
Call Setup branch, 5-1
Carriage Return Character, 8-15
Carrier On Level, 8-31
cellular, 13-9, 13-10
Cellular (Mobile), 8-45, 13-9
Cellular (PSTN), 13-9
Cellular Enhancement, 8-40
Cellular RJ11 Adapt, 8-45
Change Directory, 5-4
character format, 13-1, C-4
Choose Function, 8-4
Clone to Remote, 9-4
Command Character Echo, 8-15
command entry guidelines, 13-1
Command mode, 13-1
command responses (V.25bis), F-3
compression
  MNP5, 13-15
  V.42bis, 13-17
COMSPHERE 6700 Series NMS, 1-1
  connection, 2-5
configuration options, 8-7–8-47
  Dial Line, 8-24
  DTE Interface, 8-7
  editing and saving, 8-5
  error control, 8-33
  factory default, G-1
  for cellular, 13-9, 13-10
  Leased Line, 8-28
  Line Dialer, 8-19
  Miscellaneous, 8-43
  saving, 13-12
  Security, 8-46
  selecting, 4-11
  Tests, 8-41
  V.42/MNP/Buffer, 8-33
  viewing, 13-12
Configure branch, 8-4
connect messages, B-1
connection
  ac power, 2-4
  COMSPHERE 6700 Series NMS, 2-5
  dial-line, 2-4
  DTE, 2-3
  leased-line, 2-4
Control branch, 9-1
CT111 Rate Control, 8-13, 13-27
CTS Control (\D), 8-11, 13-13
Customer configuration areas, 8-1

D

D-Lead signaling, 8-23
Data Bits, 8-8
Data mode, 13-1
data rates suppported, D-2
DCP (Diagnostic Control Panel), 2-1
  description, 4-1
  Hidden Choice Indicators, 4-4
  keypad, 4-5
  operation, 4-4
  security access, 4-13
  shared, 4-2
  types, 4-1
  using to change factory presets, 4-11
default configuration options, 4-11, G-1
  setting with AT commands, 4-11
  setting with DCP, 4-11
Dial, 5-2
dial backup, C-4
Dial Command modifiers, 13-4
  “!” (hook flash), 5-6
  “,” (pause), 5-6
  “;” (return to Command mode), 5-6
  P (Pulse dial), 5-6, 8-19, 13-4
  R (Reverse), 5-6
  T (Tone dial), 5-6, 8-19, 13-4
  W (Wait), 5-6
dial line connection, 2-4
Dial Line Rate, 8-24, 13-24
Dial Standby/Return to Dial, 5-3
Dial Tone Detect, 8-19
Dial Transmit Level (&I), 13-10
Dial Transmit Level Type (&J), 13-10
Dialer Type, 8-19
dimensions, D-3
Directory Location 1 Callback, 8-44
disabled commands, 8-43
Disconnect, 5-2
Disconnect at 300 bps, 13-17
display configuration options (&V), 13-12
Download Code, 9-4
download failure, 9-6
download latest firmware, 9-6
DSR Control (&S), 8-10, 13-11
DTE connection, 2-3
DTE Dialer Type, 8-14
DTE Interface, 8-7, D-3
DTE LL (CT141), 13-26
DTE Local Loopback, 8-41

DTE Rate
Async, 8-7
Sync, 8-8
DTE Rate=VF Rate, 8-13
DTE rates supported, D-2
DTE Remote Loopback, 8-41
DTE RL (CT140), 13-26
DTE status, 6-4
DTE-side password
backspace character, 8-47
number of tries, 8-46
termination character, 8-46
DTR Action, 8-9
DTR Action (&D), 13-8
DTR Alarm Reporting, 8-45, 13-29
DTR Auto Redial, 8-23
DTR Continuous Repeat, 8-18, 13-23

E

Edit Password Table, 11-5
Edit Strap Group, 8-4
End (DCP option), 8-6
Enhanced Throughput Cellular (ETC), 8-26, 13-10
Entry Wait Time, 8-46
equipment
customer-supplied, 2-2, 3-1
in modem package, 2-1, 3-1
Erase All Passwords, 11-11
error codes (result codes), B-1
error control, 8-33
Error Control Fallback Character, 8-37
Error Control Mode (\N), 8-33, 13-13
Error Control Negotiate Buffer, 8-36
Escape Character, 8-15
Escape Guard Time, 8-15
escape sequence (+++), 13-1, 13-22
Extended Result Codes, 8-16

F

Factory configuration area, 8-1
factory default templates, 4-11, 8-1
Fall Forward Delay, 8-27, 8-32
Fast Disconnect, 8-20
fax
+FCLASS command, 13-8
modulations supported, D-2
operation, 12-1
types supported, 1-2, 12-1
features, 1-1
firmware download, 9-6
firmware release number, 13-5
firmware upgrade, 9-4, 9-6
flow control
modem to modem, 13-13
of modem and DTE, 8-37, 13-14
XON/XOFF, 8-37, 13-14
Flow Control of DTE, 8-37
Flow Control of Modem, 8-37
Front Panel Security Access, 4-13

G

Get_User_ID, 8-47

H

HDLC, 8-34
heat dissipation, D-3
Hidden Choice Indicators, 4-4
hook flash (!), 13-4

I

Identity, 6-3
installation
carrier mount, 3-2
standalone, 2-2
ITU–T/Bell Mode, 13-3

K

keypad, 4-5

L

LCD display, 4-4
LdEditAreafrm, 8-4
Leased Line mode, 13-10
Leased Line Rate, 8-29, 13-25
Leased Line Transmit Level, 8-30
Leased Mode, 8-28
leased-line connection, 2-4
LEDs, 4-2
Line Dialer, 8-19
Linefeed Character, 8-16
Local Analog Loop, 7-3
Local Digital Loop, 7-5
locking the DCP, 4-13
Long Space Disconnect, 8-21
LSD Control, 8-12

M

Make Busy, 9-3
Make Busy Via DTR, 8-22, 13-28
Maximum Frame Size, 8-40
menu tree, A-1
overview, 4-6
remote, 10-3

messages, 4-7
MI/MIC Dialing, 8-23
MNP5 Compression, 8-36
models, 1-2
  carrier-mounted, 3-1
  standalone, 2-1
Modem-to-Modem Flow Control, 8-38
Modulation (Dial Line configuration option), 8-24
Modulation (Leased Line configuration option), 8-28
Modulation/Data Rate, %B, %BL commands, 13-15
modulations supported, D-2

N

Network Management Address, 8-44
Network Position, 8-45
NMS Call Messages, 8-45
NMS DTR Alarm, 8-45
NMS_Reporting, 8-47
No Answer Timeout, 8-20
No Carrier Disconnect, 8-21
No Data Disconnect, 8-21
No Data Disconnect Trigger Signal, 8-22
number of
  data bits, 8-8
  stop bits, 8-9
Nxt (DCP option), 8-6

O

operating modes, 13-1
optional features, 1-2
Options (Status branch), 6-4
Originate Access security, 11-2
Originate Security, 8-47, 11-9

P

Parity Bit, 8-8
password
  Administrative, 11-4, 11-10
  Answer Access, 11-11
  combination, 11-3
  database, 11-12
  DTE-side, 11-3
  entry, 11-11
  examples, 11-12
  number of DTE password tries, 8-46
  Originate Access, 11-12
  remote access, 8-44
  Table, 11-5
  VF-side, 11-2
Password Table, 11-5
Pattern (Test branch), 7-6
pause during dialing (,), 13-4
Pause Time (for “,” dial modifier), 8-20
PBX, C-3
pin assignments
  EIA–232–D, E-2
  VF Connector, E-3
power consumption, D-3
power-up procedure, 2-5
primary channel, 10-2
Proactive Retrain, 8-27
  S23, 13-20

Q

quiet answer (@), 13-4

R

Rate Auto Originate, 8-30
Receive Buffer Disconnect Delay, 8-39
Receive Remote Loopback, 8-41
Record (Status branch), 6-4
redialing, automatic, 8-18, 8-23, 8-31, 13-23
Remote Access Password, 8-44
Remote branch, 10-1
Remote Digital Loop, 7-4
Remote Mode Indicator, 4-5
remote modem Top-Level menu, 10-3
repeat last command (A/), 13-2, 13-3
replacing modems, 2-6, 3-2, 3-4
Reset, 9-2
Reset Security, 11-10
Result Codes
  enable/disable, 8-16, 13-6
  extended, 13-7
  format, 8-17, 13-6
result codes, B-1
retrain, automatic, 8-27
return to command mode (;), 13-4
Reverse Dial mode (R), 13-4
RTS Action (&R), 8-11, 13-11
RTS/CTS Delay, 8-12, 13-20

S

S–registers, 13-18
  changing, 13-6
  displaying, 13-6
  format, 13-18
  S0 (Auto-Answer Ring Number), 8-19, 13-18
  S2 (Escape Character), 13-22
  S2 (AT Escape Character), 8-15, 13-18
  S3 (Carriage Return Character), 8-15, 13-18
  S4 (Line Feed Character), 8-16, 13-19
  S5 (Backspace Character), 8-16, 13-19
  S6 (Blind Dial Pause), 8-19, 13-19
  S7 (No Answer Timeout), 8-20, 13-19
  S8 (“,” Pause Time), 8-20, 13-19
  S10 (No Carrier Disconnect), 8-21, 13-19
  S12 (Escape Guard Time), 8-15, 13-19

S14 (Asymmetric Rate Mode), 13-20
S15 (Asymmetric Rate Mode), 13-20
S18 (Test Timeout), 8-41, 13-20
S23 (Proactive Retrain), 13-20
S26 (RTS/CTS Delay), 8-12, 13-20
S28 (SDC Negotiation), 13-21
S29 (SDC Idle Fill), 13-21
S31 (SDC Bit Encoding), 13-21
S32 (Sync DTE CRC), 13-22
S35 (Auto Redial), 13-22
S36 (Rate Auto Originate), 8-30, 13-22
S37 (Auto Redial), 8-23, 8-31
S37 (DTR Auto Redial), 13-23
S38 (DTR Continuous Repeat), 8-18, 13-23
S39 (Receive Buffer Disconnect Delay), 8-39, 13-23
S40 (Auto Make Busy), 8-22, 13-23
S41 (Dial Line Rate), 13-24
S43 (Train Time), 8-26, 13-24
S44 (Leased Line Rate), 8-24, 8-29, 13-25
S45 (Leased Line Transmit Level), 8-30, 13-25
S46 (Bad Lines Auto Originate), 8-30, 13-25
S47 (Auto Dial Standby), 8-31, 13-26
S48 (Leased–Line Carrier On Level), 8-31, 13-26
S49 (Transmit Buffer Disconnect Delay), 8-39, 13-26
S51 (DTE Remote Loopback), 8-41, 13-26
S52 (DTE Local Loopback), 8-41, 13-26
S53 (V.54 Address), 8-42, 13-27
S54 (V.54 Device Type), 13-27
S55 (Access from Remote), 8-44, 13-27
S56–S59 (Remote Access Password), 8-44, 13-27
S61 (CT111 Rate Control), 8-13, 13-27
S62 (V.25bis Coding), 8-17, 13-28
S63 (V.25bis Idle Character), 8-17, 13-28
S64 (V.25bis New Line Character), 8-17, 13-28
S66 (NMS Call Messages), 8-45, 13-28
S67 (Directory Location 1 Callback), 8-44, 13-28
S69 (Make Busy Via DTR), 8-22, 13-28
S74 (Network Position Identifier), 8-45, 13-29
S75 (Network Management Address), 8-44, 13-29
S76 (Autorate), 8-25, 13-29
S77 (DTR Alarm Reporting), 8-45, 13-29
S78 (Automode), 8-25, 13-29
S80 (No Data Disconnect Trigger Signal), 8-22, 13-30
S82 (Autorate), 8-29, 13-30
S83 (MI/MIC Dialing), 8-23, 13-30
S84 (AT Command Mode), 8-18, 13-30
S85 (Fast Disconnect), 8-20, 13-30
S88 (Straps When Disconnected), 8-43, 13-31
S89 (V.42 ARQ Window Size Increase), 13-31
S90 (DTE Rate = VF Rate), 8-13, 13-31
S91 (Cellular Enhancements), 8-40, 13-31
S92 (V.29 Train On Data), 13-32
S93 (Cellular RJ11 Adapt), 8-45, 13-32
SDCP (Shared Diagnostic Control Panel), 3-1
SDLC, 8-34
SDU (Shared Diagnostic Unit), 3-1
secondary channel, 10-2
Security branch, 11-4
Security configuration options, 8-46
security messages, 4-7
Self (Test branch), 7-2
self-test, 7-2
Send Break Control, 8-39
serial number, 13-5
Service Line, 9-3
Set Access Control, 11-4
Set Administrative Password, 11-10
Set Answer Security, 11-8
Set Originate Security, 11-9
setting factory defaults, 4-11
Speaker Control, 8-43, 9-2
Speaker Volume, 8-44
status, 4-7
Status branch, 6-1
status indicators, 4-2
Stop Bits, 8-9
store telephone number (&Z), 13-12
Straps When Disconnected, 8-43
Sync DTE Rate, 8-8
synchronous data compression, 1-2, 8-34, I-1
Synchronous Data Compression (SDC)
SDC Bit Encoding (S31), 13-21
SDC Idle Fill (S29), 13-21
SDC Negotiation (S28), 13-21
Sync DTE CRC (S32), 13-22
Sync DTE Rate (S30), 13-21

T

technical specifications, D-1
telephone interface, D-3
telephone numbers, entering, 5-5
Test branch, 7-2
Test Timeout, 8-41
tests (&T), 13-12
top-level menu, 4-7
Train Time, 8-26
Transmit Buffer Disconnect Delay, 8-39
Transmit Clock Source, 8-13
transmit level, D-3
dial, 13-10
leased line, 13-25
troubleshooting, C-1

U

UNIX, G-1, G-2
upgrade instructions, 9-6

V

V.22bis Guard Tone, 8-26
V.25bis Coding, 8-17, 13-28
V.25bis commands, F-3
V.25bis dialing commands and responses, F-1
V.25bis Idle Character, 13-28
V.25bis Idle Fill, 8-17
V.25bis New Line Character, 8-17, 13-28

V.25bis response messages, F-3
V.29 Train On Data, 8-31, 13-32
V.42 ARQ WIndow Size, 13-31
V.42bis Compression, 8-36
V.54 Address, 8-42, 13-27
V.54 Device Type, 8-42, 13-27
VF line requirements, D-3
VF Prompt Type, 8-46
VF rate, 13-24
  %B, %BL commands, 13-15
  ITU–T/Bell Mode, 13-3
VF rates supported, D-2
VF status, 6-2
view configuration options (&V), 13-12

W

wait for dial tone (W or +), 13-4

X

XON/XOFF Passthrough, 8-38

00282600